University of Alberta

Time Management Training Program: An Intervention Aimed At Increasing Exercise Participation And Exercise Adherence

By

Laurie-Ann Michelle Hellsten

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Science

In

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Laurie Hellsten

10206 90th Street
Edmonton, Alberta
T5H 1S1

April 12, 1999

The Road Not Taken

-Robert Frost

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down as far as I could
To where it bent in the undergrowth;

Then took the other, as just as fair,
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that, the passing there
Had worn them really about the same,

And both that morning equally lay
In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I-
I took the one less traveled by,
And that has made all the difference.

University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled A Time Management Training Program: An Intervention Aimed At Increasing Exercise Participation and Adherence submitted by Laurie-ann M. Hellsten Bzovey in partial fulfillment of the requirements for the degree of Master of Science.

Kerry Courneya

Dr. Kerry Courneya, Supervisor

Dr. Todd Rogers

Feb 15, 1999

Dr. Wendy Rodgers

DEDICATION

This thesis is dedicated to my family.

To my Mom and Dad: You have been there for me throughout the years with continuous love and support. Thank you so much for all your physical, emotional, and financial help. Without you both I would never have come this far or completed this degree. Thank you for making education a priority in our family and for teaching me to always leave my options open. Thank you for helping me to follow my dreams – whatever and wherever they were.

To my big brother Steve: You have always been there for me when I needed you. Thank you for being such a great role model for me even when you didn't want the job. Thank you for always letting me "tag along" throughout the years and for letting me learn from your mistakes. Thank you for helping me become the person I am today.

To my husband Peter: You are my knight. Thank you for putting up with me all the times I was too busy, too tired, too scared, too frustrated, too angry, too depressed and too overworked to pay attention to you and our home. Has anyone told you lately that "You are the bestest?" Thank you for all your love, support, and understanding. Thank you for helping me to follow my dreams. We make a great team!

And last but not least. To my cats: Tippy-Toes, Peach E. Keen, and Squeak E. Kat. Your unconditional love and support mean the world to me. How is it that all of you always know exactly when I need you the most?

I love you all.

ABSTRACT

The number one reason cited by Canadians as to why they are sedentary is lack of time for exercise. The purpose of this study was to examine the effectiveness of a time management training program intervention on participants' exercise participation using the Theory of Planned behavior as the theoretical framework. The study involved 108 participants ranging in age from18-59 randomly assigned to wait-list control or experimental conditions. The participants were given the Time Management Behavior Questionnaire (TMB) and attended a 3 hour time management training seminar. In order to control for significant differences among the two groups at baseline, a MANCOVA was completed for the follow-up data. Both the MANCOVA and the follow-up univariate results indicated significant differences. The experimental group reported using more mechanics of time management skills than the control group, and the control group reported more strenuous exercise than the experimental group.

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CHAPTER ONE

Health Benefits of Exercise

Physical activity and exercise have been positively correlated with numerous physiological health benefits including the prevention of cardiovascular disease and obesity (Bouchard, Shephard, & Stephens, 1993; Powell, Thompson, Caspersen & Kendrick, 1987); the reduction of the risk of all-cause mortality, coronary heart disease, osteoporosis, non-insulin dependent diabetes, hypertension, and colorectal cancer (Ainsworth, Montoye & Leon, 1994; Bouchard, Shephard & Stephens, 1993). Engaging in physical activity and exercise can also provide individuals with protection against cancers and infectious diseases (Rhind, Shek, Shinkai & Shephard, 1994). In addition to the physiological health benefits of exercise there are many psychological benefits of exercise such as reduced state anxiety (Petruzello, Landers, Hatfield, Kubitz & Salazar, 1991); decreased levels of depression (North, McCullagh & Tran, 1990; Taylor, Sallis & Needle, 1985); reduced negative stress (Crews & Landers, 1987); increased cognitive functioning (Thomas, Landers, Salazar & Etnier, 1994); improved self-esteem (McMahon, 1990; Sonstroem, 1988); enhanced self-concept (Stein & Mota, 1992); and a positive effect on life stress (Brown & Siegel, 1988).

Motivational Problems in Exercise

Despite the abundance of documented evidence supporting the correlation between exercise and health benefits, one in ten Canadians are sedentary (Canadian Fitness and Lifestyle Research Institute, CFLRI, 1996). Studies have shown that to maximize health benefits, individuals should participate in physical activity or exercise every other day for at least thirty minutes at a moderate or greater intensity (CFLRI,

1996). According to the results from the 1995 Canadian Physical Activity Monitor, only two out of five Canadians are active enough to benefit their cardiovascular health (CFLRI, Prevention, 1996). Further research has shown that the Canadian population is not alone in their sedentary habits. Following their review of surveys conducted in other countries, Stephens and Caspersen (1994) found that only ten per cent of the Canadian, Australian, English and American populations engaged in aerobic activities. "Aerobic activities" was defined as engaging in vigorous activities during leisure time for a minimum of twenty minutes, three times per week at a minimum intensity of seven METs, (Stephens & Caspersen, 1994).

In addition to the low exercise participation rates there are extensive problems with exercise adherence. Approximately fifty per cent of the individuals who initiate a structured exercise program drop out within the first six months (Dishman, 1988). Exercise adherence problems have been found for children, university students, the middle aged, and the elderly. In addition, the adherence problem has also been identified in primary prevention, secondary prevention, and work-site settings (Robinson & Rodgers, 1994).

It is necessary to understand exercise behavior in order to produce realistic intervention strategies aimed at encouraging exercise behaviors and thus improving physical and psychological health. The process of distinguishing both the determinants and the barriers to exercise behavior has been the central research theme of many researchers (Dishman, 1988; Dishman, Sallis, & Orenstein, 1985; Martin & Dubbert, 1982). Once the determinants and the barriers of exercise have been identified, the

prediction and explanation of the exercise behavior may become feasible (Dishman, 1994).

Barriers To Exercise

There are numerous reasons that individuals provide as to why they do not participate in or adhere to exercise programs. Common barriers to exercise cited by both adult and youth populations are inadequate facilities (CFLRI, 1996; Fitness Canada, 1983), the physically demanding nature of exercise, existing medical problems (Godin, Shephard & Colantonio, 1986), lack of social support, laziness, family obligations, and lack of interest (Harris, 1979; Tappe, Duda & Ehrnwald; 1989). However, the predominating reason given by individuals in an attempt to explain their inactive lifestyles or their reasons for dropping out of organized clinical and community exercise programs is lack of time (Dishman, 1990).

In a cross-sectional study involving 1019 respondents of the United States, the respondents reported that the principal reason for not exercising was "lack of time or being too busy" (Gallup Organization, 1985). In a similar American survey, respondents indicated that the three major reasons for not getting enough exercise were "not enough time", "health reasons" and "family obligations" (Harris, 1979). In Canada, Canadians' perceived the primary barriers to exercise to be "no time due to work pressures", "too lazy or lack of energy," and "inadequate facilities" (Canada Fitness Survey, 1983). The most recent Canadian survey, conducted by the CFLRI in 1995, found three major barriers to physical activity: lack of time, lack of energy, and lack of motivation. Lack of time was described by Canadians from the ages of 18 to 64 as the number one barrier to physical activity. The 65 plus age group was the only age group to not identify lack of

time as the number one barrier to physical activity. However, this population group still identified lack of time as the sixth most serious barrier. Moreover, lack of time as a barrier to physical activity did not differ across genders. Male and female Canadians between the ages of 18 and 64 identified lack of time as the most significant barrier to physical activity. Consequently, lack of time has been recognized as the number one barrier to exercise for both adult and youth populations.

Model Rationale

Lack of time as a barrier to exercise can be studied from the perspective of the theory of planned behavior, (TPB). The TPB is a theory that was originally developed to predict intention and behavior (Ajzen, 1991). The TPB states that an individual's intention to perform a behavior is the principal determinant of the behavior (Ajzen, 1991). An individual's intention is, in turn, dependent upon an individual's attitude, subjective norm, and perceived behavioral control. The TPB states that individuals will intend to carry out a behavior when they think positively about the behavior, when they believe that their significant others think they should carry out the behavior, and when the individuals themselves perceive the behavior to be under their control (Ajzen, 1988). In situations where the individual does not have complete control over the behavior, the individual's perceptions of control may be the most significant predictor of his or her behavior (Ajzen, 1991).

Time Management

Numerous intervention strategies have been developed in an attempt to help alter exercise participation and exercise adherence patterns. Some of the intervention strategies used include health education programs, behavioral approaches such as

stimulus control and cognitive-behavioral approaches which include techniques such as goal setting, self-monitoring, and feedback (Dishman, 1988). None of these approaches, however, address the primary barrier reported by Canadians, which is lack of time (CFLRI, 1996). The perceived exercise barrier of lack of time may be the result of poor time management skills such as inadequate planning, insufficient scheduling, and inappropriate time habits (Mackenzie, 1972, 1975, 1990; Shipman, Martin, McKay & Anastasi, 1983). The use of time management skills has the ability to create "free time" (Mackenzie, 1972, 1975, 1990) and thus a time management training program may be an appropriate intervention to help remedy the participation and adherence problems found in exercise.

Time management can be defined as the idea of having control over your time through balance, flexibility and spontaneity. Ideal time management behavior consists of five specific time management skills or activities. These skills include time analysis, goal setting, prioritizing, scheduling, and establishing new time habits (Mackenzie, 1972, 1975, 1990).

There is a distinct lack of empirical research on time management skills and behaviors and the effectiveness of time management training programs in managerial, business, and administrative fields. A study by Macan (1994) was the first study to empirically examine the association between time management behaviors and the TPB. More specifically, Macan (1994) investigated the TPB, with a concentration on an individual's perceived control over time. Macan (1994) suggested that time management behaviors function through a perception of control over time. She designed a process model of time management which stated that the consequences of time management such

as reduced stress, increased job satisfaction, and increased job performance would be evident only if the time management behaviors provided the individual with a sense of perceived control over his/her time.

Although the principal perceived barrier to exercise participation and adherence is lack of time there has been no research on time management in the physical activity and exercise domain. In addition, no study has examined the effect of a time management intervention program in the exercise field.

Purpose of the Study

The purpose of this study was to investigate the effectiveness of a time management intervention using the TPB as the theoretical framework. Specifically, four questions were addressed. 1. What is the effect of the time management training program on the participants' subsequent use and adoption of time management skills? 2. What is the effect of the time management intervention on the participants' perceptions of time as a barrier to exercise? 3. What is the effect of the time management intervention on the participants' perceptions of control over time? 4. Does a higher perception of control over time have an effect on exercise behaviors? A schematic representation of study design is illustrated in Figure 1-1 and Figure 1-2.

Hypotheses

Four distinct hypotheses were identified. First, it was hypothesized that the participants who were administered the time management training program intervention (experimental group) would adopt and utilize more time management skills than the control group. Second, it was hypothesized that the use of time management skills by the experimental group would result in reduced perceptions of time as a barrier to exercise,

as compared to the control group. Third, the reduction of lack of time as a barrier to exercise for the experimental group was hypothesized to result in greater perceptions of control over exercise than the control group. The fourth and final hypothesis examined whether the higher perceptions of control over time experienced by the experimental group would lead to more frequent exercise behaviors for the experimental group over the control group.

Figure 1-1

Schematic Representation of Study Design : Control Group

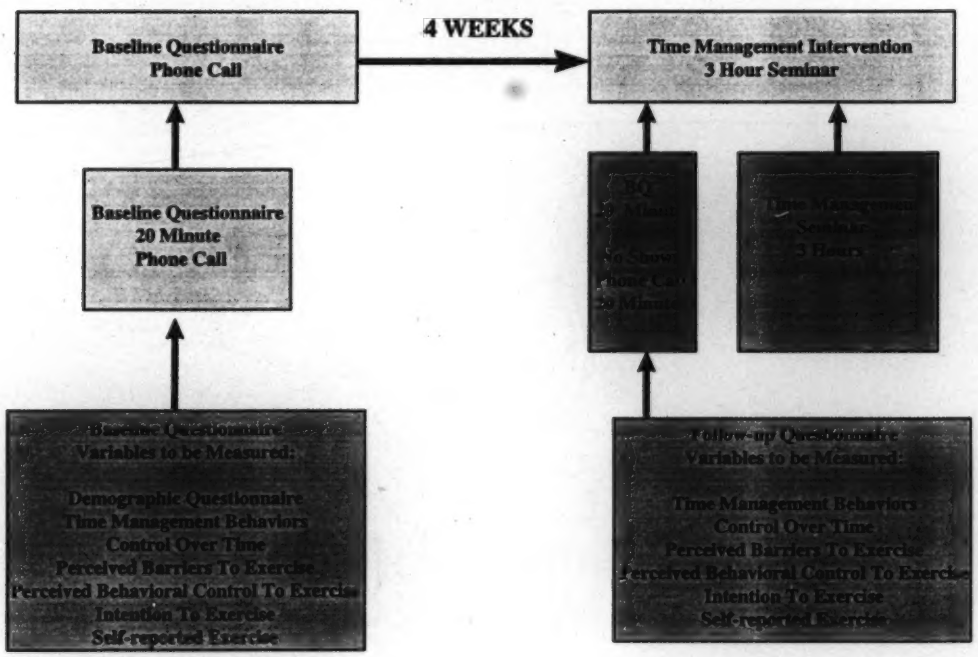
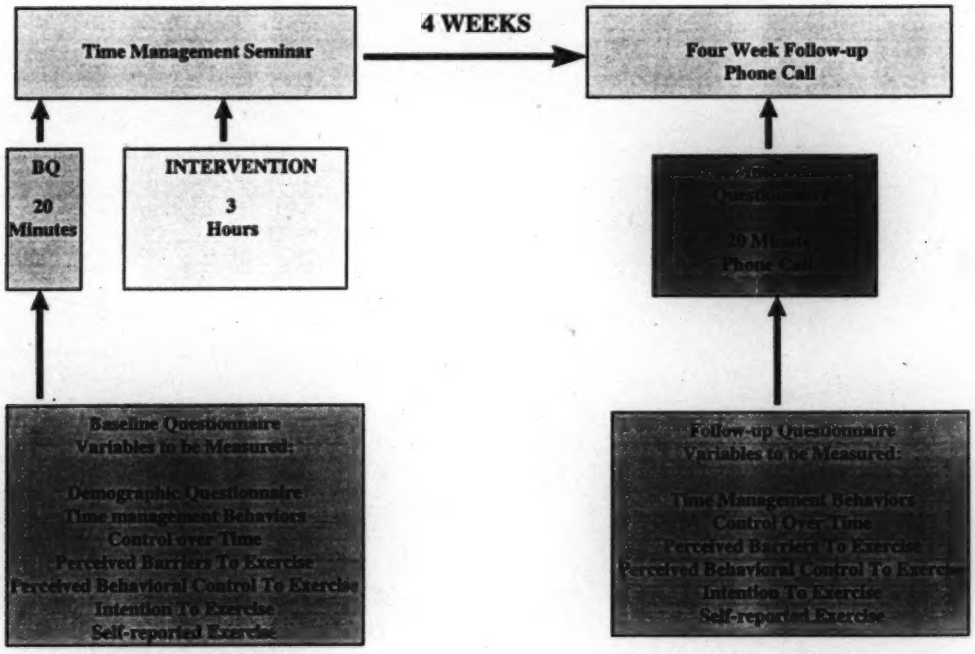


Figure 1-2

Schematic Representation of Study Design : Experimental Group



CHAPTER TWO

Review of Literature

Introductory Comments

The review of literature is organized into seven sections. A summary of the TPB is provided in the first section. This is followed by a brief survey of empirical studies involving the TPB in section two. The third section comprises a review of the perceived barriers to exercise. The fourth section contains an examination of the time management literature and is followed by an empirical inspection of time management in section five. The sixth section includes a critique of goal setting theory. This is followed by an overview of the empirical goal setting literature in the last section.

The Theory of Planned Behavior

The TPB is classified as a linear goal based theory and it is concerned with the reasons why individuals initiate, adhere to or reject healthy behavior patterns (Maddux, 1993). The primary goals of the TPB are to understand, and therefore to predict, social behaviors at the level of individual decision making (Godin, 1994). The theory assumes that individuals behave in a rational manner by taking into account all available information and then considering the potential implications of their behavior (Courneya & McAuley, 1994). The TPB is an evolution of the theory of reasoned action (TRA) and was created to explain behaviors that are not entirely volitional (Ajzen, 1985, 1991).

The TPB contains four major components as shown in Figure 2-1. Behavior is directly dependent upon the individual's intentions to perform the behavior. Intention is in turn, dependent upon the individual's attitude towards the behavior, the individual's

subjective norm towards the behavior and the individual's perception of control over the behavior.

Intention

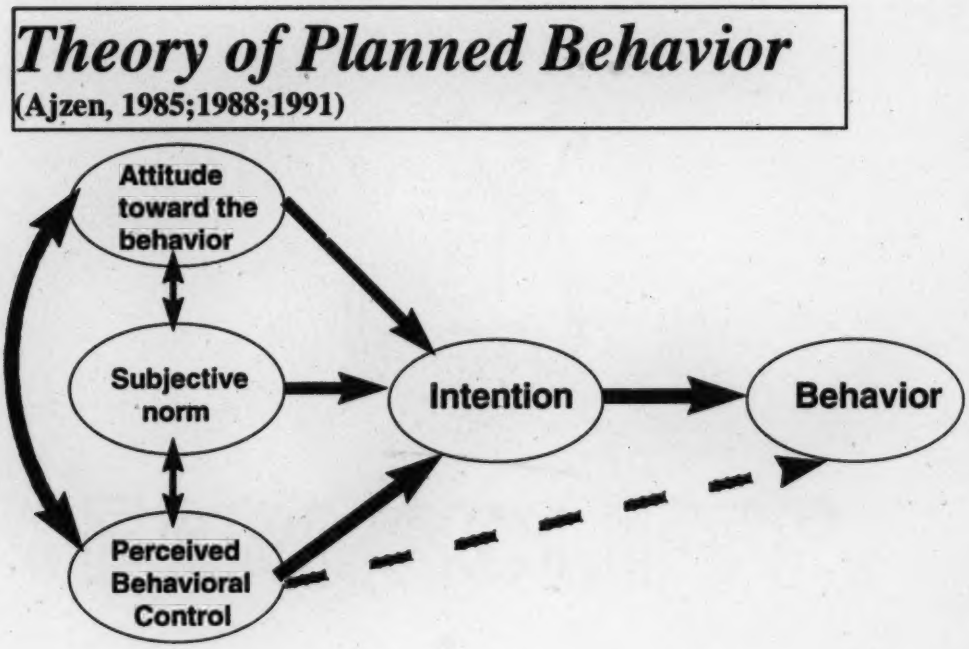
Behavioral intentions are the immediate precursors to behavior and are the most important predictors of behavior (Ajzen, 1991). Behavioral intentions are a function of the individual's beliefs about the likelihood that performing a certain behavior will lead to a specific outcome (Ajzen, 1991). Intentions also characterize the motivational factors that influence behavior and indicate how hard individuals are willing to try or how much effort they are willing to exert in order to perform a behavior (Ajzen, 1991). The stronger the intention to engage in a behavior, the more likely it is that the behavior will be performed.

However, a behavioral intention will result in the performance of a behavior only if the behavior is, to some degree, under an individual's voluntary control. Most behaviors require non-motivational factors such as the availability of resources such as time, money and, skill (Ajzen, 1991). Therefore, behavioral performance depends jointly on motivation or intention and ability or behavioral control.

Attitude Towards A Behavior

Attitude towards a behavior develop from the beliefs an individual holds about the behavior (Ajzen, 1991). Beliefs are formed about a behavior by associating the behavior with certain positive and favorable or negative and unfavorable attributes. Individuals learn to favor behaviors which have positive consequences and reject behaviors that are associated with negative consequences (Ajzen, 1991). Therefore, the assessment of

Figure 2-1


Theory of Planned Behavior
(Ajzen, 1985;1988;1991)
Attitude toward the behavior
Subjective norm
Perceived Behavioral Control
Intention
Behavior

attitudes towards the behavior consists of an assessment about the expected consequences and an assessment of the value of these consequences (Maddux, 1993).

Subjective Norm

Perceptions of social norms influence behavior indirectly by influencing intentions to perform the behavior. The subjective norm component is determined by two factors. The first factor involves an assessment of the individual's perceived expectations about significant others' beliefs that he or she should perform the behavior. The second factor is a measure of the individual's motivation to comply with the beliefs of significant others (Blue, 1995; Godin, 1993; Godin, 1994; Maddux, 1993).

Perceived Behavioral Control

Perceived behavioral control is the distinguishing component between the TRA and the TPB (Ajzen, 1985, 1991). Actual control over behavior is difficult, if not impossible to measure because of the many accidental and unexpected external factors that affect the behavior. It is also difficult to correctly identify and assess internal factors and it is these factors which may influence the individual's actual control over a behavior (Ajzen & Madden, 1986). Thus, depending upon the accuracy of an individual's perceptions, perceived behavioral control may be considered as a substitute or an approximation of actual control. Perceived behavioral control is extremely important in situations where an individual may have incomplete or limited control over a behavior. The addition of the measurement of perceived behavioral control increases the predictability of behavior beyond what is provided by intention alone (Gatch & Kendzierski, 1990).

The direct effect of perceived behavioral control on intention can be considered significant when the behavior in question is likely to have some aspect not under volitional control (Ajzen, 1991; Madden, Ellen & Ajzen, 1992). The ability of an individual to perform a behavior will be directly influenced by perceived behavioral control when perceived behavioral control accurately reflects the control an individual has over a behavior (Gatch & Kendzierski, 1990; Madden, Ellen & Ajzen, 1992).

However, perceived behavioral control may not approximate actual control if information about the behavior is minimal, if the requirements or the available resources involved in the execution of the behavior have changed, and/or if the behavior is new or if unfamiliar factors have entered into the situation. In addition, perceived control over behaviors may be partially based upon past experiences with the behavior and by second hand information about the behavior from significant others. This information may increase or decrease the perceived difficulty of performing the behavior (Ajzen, 1991; Ajzen & Madden, 1986).

Perceived behavioral control can also have an indirect effect upon behavior. If individuals believe that they have minimal control over the behavior or that they lack the required resources to perform the behavior, than they may have little or no intention to perform the behavior regardless of how favorable their attitudes or their subjective norms are (Madden, Ellen & Ajzen, 1992).

TPB Literature Review

The TPB has been utilized extensively to explain human behavior in many different domains, including the field of exercise and physical activity. A literature review was conducted examining exercise studies that used the TPB as a theoretical framework. Sources of the review included a CD-ROM search of MEDLINE, SportDiscus and PsychLit, cross-referencing of journal articles, and hand searches of relevant journals. Key words utilized in the study included TPB, exercise, physical activity, intention, exercise motivation, and Ajzen. Studies that examined the TPB in relation to physical activity or exercise were included.

Three literature reviews comparing the TPB and the TRA were located (Blue, 1995; Godin, 1993; Godin, 1994). In total, 21 studies examining the TPB and physical activity or exercise were identified and these studies are described in more detail in Appendix A.

Of the studies examined, 20 studies either successfully utilized the TPB, or found the TPB to be useful and or at least as useful as an alternate theory (TRA, social cognitive models, and the Triandis model) in predicting exercise intention or behavior. Results showed that perceived behavioral control and attitude were significantly better predictors of exercise intention than subjective norm (Dzewaltowski et al., 1990; Kimiecik, 1992; Theodorakis, 1994). Results from the majority of the studies also showed that the inclusion of perceived behavioral control enhanced the prediction of behavioral intention.

Perceived behavioral control was consistently the most important predictor of exercise behavior. The contribution of perceived behavioral control to the prediction of

behavior appeared to vary inversely with the amount of control the subjects believed they had over the behavior (Madden et al., 1992).

In addition, three studies by Godin and colleagues (Godin et al., 1989, 1991, 1994) examined individuals' intentions to exercise through the use of the TPB and identified the individuals' perceived barriers to exercise. One of the most commonly stated barriers to exercise, regardless of the population examined, was lack of time for exercise. Theodorakis (1994) also identified several barriers to exercise such as work, family, children, weather, illness, transportation, and free time that may have prevented the subjects in his study from exercise participation. Theodorakis (1994) suggested that perceived behavioral control should be recognized as a central variable in exercise participation and that in order to overcome participation problems, interventions aimed at time organization need to be developed.

Perceived Barriers to Exercise

One of the major environmental barriers to physical activity and exercise is time pressure (Dishman, Sallis & Orenstein; 1985). Lack of time is the principal and also the most prevalent self-reported reason that adult individuals give as to why they drop-out of supervised clinical and community exercise programs (Dishman, 1982; Dishman, 1990; Dishman, 1991; Dishman et al., 1985;; Martin & Dubbert, 1982; Oldridge, 1982) and for inactive lifestyles (CFLRI, 1996; Dishman, 1991; Dishman et al., 1985; Gallup Organization, 1985; General Mills, 1979; Harris, 1979; Slenker, Price, Roberts, & Jurs, 1984). In the physical activity determinents literature between 1988 and 1991, lack of time has consistently been documented as having a negative association with physical

activity for both the general population and for supervised setting samples (Dishman & Sallis, 1994).

In a cross-sectional study of the United States, 1019 representative adults were interviewed and reported that their major reason for not exercising was "no time or too busy" (Gallup Organization, 1985). In a similar survey on American Fitness, the major reasons for not getting enough exercise were "not enough time," "health reasons," and "family obligations" (Harris, 1979). The respondents of the 1983 Canada Fitness Survey indicated "no time due to work pressures," "too lazy or lack of energy," and "inadequate facilities" as the three major perceived barriers to exercise (Canada Fitness Survey, 1983). The most recent Canadian survey, conducted by the CFLRI in 1995, found three major barriers to physical activity (CFLRI, 1995). These three barriers were identified as lack of time, lack of energy and lack of motivation. The three major barriers to exercise identified by Canadians in 1983 are essentially the same three barriers identified by the Canadian population twelve years later, in 1995.

According to the 1995 Physical Activity Monitor (CFLRI, 1996), lack of time was described by Canadians from the ages of 18 to 64 as the number one barrier to physical activity. The lone group to not identify lack of time as the number one barrier to physical activity was the 65 plus age group and this group still identified lack of time as the sixth most critical barrier. Moreover, lack of time as a barrier to physical activity did not differ across genders; both male and female Canadians between the ages of 18 and 64 identified lack of time as the most significant barrier to physical activity.

Steinhardt and Dishman (1989) examined two samples of the general population in an attempt to develop self-report scales for outcome-expectancy values and perceived

barriers (Steinhardt & Dishman, 1989). The first study involved 161 student volunteers from the University of Georgia while the second study examined 968 CONOCO full-time employees. Results of these two studies showed that outcome-expectancy values and perceived barriers for physical activity could be reliably assessed in both the college and corporate samples. Important barriers to physical activity identified by both the college and the corporate samples were lack of time and lack of effort.

One plausible explanation for this consistent report of lack of time as a barrier to physical activity is that in reality, the lack of adherence and participation may not reflect a lack of time but instead reflect a lack of interest, intention, or commitment (Dishman, 1990; Dishman et al., 1985). This interpretation is based upon the fact that population surveys indicate that regular exercisers are as likely as (Gallup Organization, 1985; General Mills, 1979; Harris, 1979), or more likely than (Canada Fitness Survey, 1983) the sedentary to view time as a barrier to physical activity or exercise. Moreover, among family members, working women in The General Mills American Family Report 1978-1979 were more likely than were non-working women to be regular exercisers (General Mills, 1979). In addition, 50 % of the single parents in this study were regularly active and 33 % of parents in other parental groups were active (General Mills, 1979). According to the 1995 Physical Activity Monitor, Canadian single parents were also more active than individuals with children who have a partner (CFLRI, 1996).

One possible interpretation of this report is that a barrier such as time is irrelevant to those individuals who have not made the decision to exercise, while active people are more attuned to and therefore more able to cope with an environmental barrier such as time (Dishman et al., 1985). It is not yet clear whether time convenience represents

environmental determinants, perceived determinants or poor behavioral skills such as poor time management skills or whether they are simply rationalizations of a lack of motivation to be active (Dishman, 1990).

Lack of time as a perceived barrier to exercise or being "too busy" to exercise has also been found in the adolescent and youth populations. Time constraints have been reported as a significant barrier to the recruitment of at-risk children into structured exercise programs (Rowland, 1986) and as a major barrier to exercise for high school students (Tappe, Duda, & Ehrnwald, 1989).

Tappe et al. (1989) examined the perceived barriers toward exercise among 236 high school aged males and females. Results indicated that adolescents who reported low levels of physical activity perceived time constraints as a greater barrier to exercise than highly active adolescents. In addition, a gender difference in perceived barriers to exercise existed among the adolescents. Females reported "wanting to do other things with my time" as the most relevant barrier to exercise (Tappe et al., 1989).

The finding by Tappe et al. (1989) that time constraints is a significant barrier to exercise was consistent with earlier adult studies. These results indicate the need for adolescents and adults alike to learn how to effectively use time management strategies that emphasize priorities and improved scheduling of exercise activities (Tappe et al., 1989).

Perceived lack of time and disruptions in daily routines may interfere with exercise participation (Dishman et al., 1985). Time problems may also exist because different activities require different amounts of commitment to maintain participation. The time commitment required for an individual to plan 30 minutes for a run after supper

is probably less than that needed to join a fitness club and make the necessary preparations to run the treadmill for thirty minutes several times per week (Dishman et al., 1985). Perceived environmental barriers such as time have the ability to outweigh an individual's personal intention to exercise. Therefore, due to the correlation between time as a perceived barrier and exercise behavior, perceived barriers should receive attention in the planning of physical activity programs (Steinhardt & Dishman, 1989). Time management problems may require vigilant behavioral planning on the part of the exerciser. In addition, behavioral and cognitive-behavioral strategies developed to mitigate time management problems may be beneficial adjuncts to existing exercise programs and may help to increase exercise participation and exercise adherence (Dishman et al., 1985).

Despite this abundance of research which shows that time management is the number one perceived barrier to exercise for both adults and adolescents, no one has examined the effectiveness of a time management training program as an intervention strategy to increase the participation and adherence of individuals to exercise. With the exception of the research on goal setting, time management has been based largely on assertion, prescription, and personal experience rather than on empirical research (Bluedorn & Denhardt, 1988). There is substantial popular literature on the benefits of time management. Time management has been a topic of numerous books (Blanchard & Johnson, 1981; Bliss, 1976; Burka & Yuen, 1983; Lakein, 1973; Mackenzie, 1972, 1975, 1990). In addition to the books, "how to" time management articles abound in journals such as *Harvard Business Review*, *ABA Banking Journal*, *Academy of Management Executive*, *Personnel Journal*, and *Scholastic Coach*. Abundant seminars, tapes, videos,

and even scheduling devices are proof of the suspected and believed benefits of time management. However, there is little empirical research on time management and the effectiveness of time management in any of the organizational, educational, administrative, or industrial fields.

Time and Time Management

A CD-ROM search of time management in the business, management, and administrative areas was conducted. The search located several empirical papers as well as generic and nonempirical books and articles on time management. This section of the review will begin with a definition of time and time management and proceed with a description of time management skills and behaviors as described in the popular literature. The third section will consist of a review of the empirical studies examining time management and the effectiveness of time management programs.

The effective use of time has long been recognized as a crucial factor for success in many different fields and many practical techniques have been devised for improving time management (Puffer, 1989). Although time is central to human behavior (McGrath & Rotchford, 1983) it is also a scarce resource and thus time must be managed (McGrath & Rotchford, 1983; Schriber & Gutek, 1987). Time can be considered an equal, free, and unbiased commodity that is completely at an individual's disposal (Shipman, Martin, McKay & Anastasi, (1983). The main difference among individuals is in the way that the individual uses the time that is available (Shipman et al., 1983). Individuals attempt to control time by dividing it into segments that are then allocated to a number of tasks and activities (Schriber & Gutek, 1987). Time use can be defined as calculating the number

and kinds of activities that occur in time intervals and the costs and payoffs associated with those activities (McGrath & Rotchford, 1983).

Individuals are often unaware of their particular time personalities (Bluedorn, Kaufman, & Lane, 1992). Two of the fundamental differences among people are their overall temporal orientations and their differing abilities to deal with the future (Bluedorn & Denhardt, 1988). Individuals also differ in their temporal orientations to activity (Bluedorn & Denhardt, 1988). There are degrees of polychronicity (Bluedorn et al., 1992). Monochronic time is a preference for doing one task at a time while polychronic time refers to a preference for doing two or more things simultaneously (Bluedorn & Denhardt, 1988; Bluedorn et al., 1992). Most of the time management techniques seem to imply that the monochronic time orientation is superior to the polychronic orientation (Bluedorn & Denhardt, 1988). However, comparative research between monchronic and polychronic orientations is nonexistent (Bluedorn & Denhardt, 1988).

Time can also be divided into other types of time categories such as work time, leisure time, free time, and prime time (Shipman et al., 1983). Men and women are also believed to differ in their perceptions' of time. Men's work time and leisure time are clearly demarcated, with leisure hours "earned" due to the hours worked outside the home (Lenskyj, 1988). For women, the boundaries between work and leisure are thought to be blurred (Lenskyj, 1988). Thus, women may have more barriers to leisure due to lack of time and the responsibilities of the home (Lenskyj, 1988).

Time Management Skills And Behaviors

Time management has been described in many different fashions including spontaneity, balance, flexibility, and having control over your time (Lakein, 1973). Time

management can also be characterized as a habit developed only through determination and practice (Simpson, 1978), as prioritizing and respecting those priorities (Soucie, 1986), as setting priorities and scheduling tasks (Jordan, Cobb & McCully, 1989). Time management can also be considered as one process by which an individual can accomplish the tasks and goals which will enable he/she to become more effective (Schuler, 1979), as the necessity that the individual get control over the timing and the content of what he/she does (Oncken Jr. & Wass, 1985), and lastly as what we can accomplish with time (Mackenzie, 1972, 1975, 1990).

It is also believed that improper time management can lead to stress (Mackenzie, 1990; Schuler, 1979; Soucie, 1986). The essential ingredient of time management, and thereby, of stress management is planning (Jordan et al., 1989; Lakein, 1973; Mackenzie, 1972, 1975, 1990). Personal planning can reduce stress by relieving the time crunch (Bliss; 1976; Stevens & Pfost, 1984). Planning can be defined as bringing the future into the present (Lakein, 1973). By planning first and then relaxing, an individual is capable of accomplishing much more. Mackenzie (1975) states that every hour spent in effective planning saves three to four hours in execution. The greatest asset of planning is that it promotes living by action rather than by reaction (Rice, 1984).

Although there is debate over exactly what constitutes good time planning, the authors have similar recommendations. Mackenzie (1972, 1975, 1990) states that effective planning involves time analysis, setting goals and objectives, scheduling, and creating a daily plan. Similarly, Shipman et al. (1983) identify six principles for effective time management. These are being aware of self, structuring time appropriately, setting goals and priorities, increasing personal efficiency and effectiveness, scheduling time for

activity, and scheduling relaxation time. An individual will become effective in using their time only when the individual clearly knows what they want to do, what they need to do, and for which specific target date (Soucie, 1986). An individual must become disciplined enough to properly use time and to respect their established priorities while minimizing distractions from others as well as situations which have the ability to displace priorities in terms of time and energy (Soucie, 1986).

Time Analysis

It is first important to assess any specific areas of inefficient time management (Soucie, 1986; Stevens & Pfost, 1984). Awareness is important (Soucie, 1986) because if the individual expects to control time, the individual must know where their time is spent (Mackenzie, 1972, 1990). Therefore, the first step in effective time management is finding out where your time is currently being spent by using a time log (Schuler, 1979; Simpson, 1978; Stevens & Pfost, 1984; Soucie, 1986). Since memory is often deceiving, and individuals often remember only the more interesting or important events of the day and forget the minor events, a time log is essential (Shipman et al., 1983; Simpson. 1978). A time log can be defined as a systematic method of recording actual time use at regular intervals during the day (Simpson, 1978). The greatest benefit of a time log is that it helps people to identify the real problems relating to time use and forces individuals to face reality so that they can take corrective action in a meaningful way (Mackenzie, 1990). In addition, a time log reinforces the fact that remedial action is required and provides the individual an objective evaluation of their use of time (Mackenzie, 1975). Individuals will discover if they have neglected priorities and if they

have long range plans. A time log will also show the individual that on average, people have very little amount of time that is unplanned or free (Mackenzie, 1975).

There are three common pitfalls to time logs. These pitfalls are unrealistic or unchallenging goals, trusting memory, and omitting detail (Mackenzie, 1975). It is essential to provide detail about the activities in some type of comments column of the time log in order to have an accurate picture of where time is spent. A time log should be filled out throughout the day and individuals should refrain from trying to catch up at the end of the day (Mackenzie, 1990) because mundane activities and wasted time will often be forgotten. Time logs should take no longer than five minutes total throughout the day to complete (Simpson, 1978). However, the length that time logs should be kept varies according to author. Mackenzie and Bliss suggests that time logs should be kept for at least three days (Bliss, 1976; Mackenzie, 1990) while Simpson suggests that time logs should be kept upwards of a two to three week period (Simpson, 1978).

Once the time log has been completed, the time log needs to be examined for "time wasters" (Mackenzie, 1972, 1975, 1990; Simpson, 1978) or "time robbers" (Schuler, 1979). The time wasters need to be identified (Soucie, 1986) in order to eliminate such activities from the schedule. Common time wasters involve activities such as jobs that contribute little or nothing, tasks that can be delegated, involvement in meetings (Schuler, 1979; Simpson, 1978), unexpected interruptions, underestimating time commitments and task requirements, personal disorganization (Stevens & Pfost, 1984), telephone interruptions, drop-in visitors, ineffective delegation, lack of objectives, priorities and planning, shifting priorities, the inability to say "no", procrastination, lack of self-discipline, too much socializing, poor communication, attempting too much at

once (Taylor & Mackenzie, 1986), commuting time, and family demands (Shipman et al., 1983). By eliminating such activities from the schedule or attempting to limit these activities, blocks of free time will be created (Simpson, 1978).

Goal Setting

Once individuals have identified exactly where time is being spent, they need to define their personal goals (Soucie, 1986). These goals should be put in writing (Blanchard & Johnson, 1981; Schuler, 1979; Soucie, 1986). Goal setting should start with a list of dream goals or the individual's lifetime goals. Dream goals may be career, personal, spiritual, community, or family orientated. Once the dream goals have been examined, long term goals then need to be identified. These are the goals that will be achieved within the next three years (Bliss, 1976; Schuler, 1979; Soucie, 1986). A long term goal can also be defined as a specific target that can be broken down into smaller and more immediate goals (Mackenzie, 1990). From these long term goals, short term goals need to be established in line with the long term goals. Short term goals consist of goals that need to be accomplished within the next four to six months (Soucie, 1986). Short term or weekly objectives and daily objectives need to follow short term goals (Soucie, 1986). An objective is defined as an intermediate target with a shorter time frame (Mackenzie, 1990).

It may be helpful to list each goal on a single piece of paper and then the sub-goals or the steps needed to reach that goal (Blanchard & Johnson, 1981). It is also important to define the goals in behavioral terms (Burka & Yuen, 1983). Therefore, the specific behaviors which are needed to attain each goal should also be listed (Schuler, 1979). A behavioral goal needs to be observable, specific, and concrete and must be able

to be broken down into small steps (Burka & Yuen, 1983). There may be several behaviors for each goal (Schuler, 1979) and by listing each behavior an individual can check on whether their behaviors match what is required of them to reach their goal (Blanchard & Johnson, 1981). In addition, it is important for the individual to state any personal strengths or weaknesses which will enable or prevent their engaging in the behavior required to reach the corresponding goal (Schuler, 1979).

Goals should be demanding in order to motivate the individual to do their best (Mackenzie, 1990). However, the goals should be achievable and not unrealistic (Burka & Yuen, 1983; Mackenzie, 1990). Goals should be specific and measurable (Mackenzie, 1990) in addition to being clear and well defined (Ashkenas & Schaffer, 1985). However, goals should also be flexible (Burka & Yuen, 1983; Mackenzie, 1990) as further goal revisions will periodically be necessary to ensure that the goals remain realistic (Burka & Yuen, 1983). Goals should have deadlines (Mackenzie, 1990) and both the goal and the deadline should be written down (Lakein, 1973; Mackenzie, 1990). Writing goals down helps to define the goals and goals that are written can be scrutinized, analyzed, refined, changed, and updated (Lakein, 1973). Goals need to be agreed upon by those who attempt to achieve them (Mackenzie, 1990). In general, goals should set the focus of how individuals spend their time (Mackenzie, 1990).

Prioritizing

Priorities must be set (Ashkenas & Schaffer, 1974; Mackenzie, 1972, 1975, 1990; Rice, 1984; Schuler, 1979; Simpson, 1978; Stevens & Pfost, 1984). Values and goals must first be established in order to set priorities (Jordan et al., 1989). Priorities can be defined as goals and objectives that have been ranked in order of importance (Mackenzie,

1990). There are two aspects to consider when setting priorities; the long range importance of the task and the short term urgency (Mackenzie, 1990). The Pareto Principle states that the significant items in a given group normally constitute a relatively small portion of the total items in the group (Bliss, 1976; Mackenzie, 1972). In the time management field, most people spend 80% of their time doing duties that are related to only 20% of the total job results. This principle occurs because individuals fail to set priorities (Schuler, 1979). However, different criteria can result in different priorities (Lakein, 1973). Activities or responsibilities should be categorized into trivial, routine and innovative, or must do now, must do, desirable to do, and can wait (Schuler, 1979). Alternatively, activities could be separated by important and urgent, important not urgent, urgent not important, busy work and wasted time (Bliss, 1976).

One common system utilized to prioritize tasks is the ABC method (Jordan et al., 1989; Lakein, 1973; Simpson, 1978). The "A" represents jobs or activities of greatest importance or value to an individual's personal organizational goals. Unless, the "A" is a long-term project or a continuous goal, the "A" should be completed the same day as the prioritizing. "B" tasks are tasks of intermediate value. "C" tasks are of low value and can usually be postponed. To utilize this system, an individual must appraise the importance of each task and assign a letter according to priority. In order to employ the ABC system, the individual must start working with all the A's and not the B's or C's. It is important to understand that the ABC's change over time and therefore it is imperative to set continual priorities (Lakein, 1973).

It is also necessary to include all of the priorities for other daily activities on a daily plan (Rice, 1984). These priorities may include activities such as personal fitness,

recreation programs, spiritual, family, social life, reading, writing, personal goals, personal matters, relaxation periods, continuing education, sleep and anything else that an individual may desire to accomplish on a daily plan

Scheduling

One of the most important aspects of time management is scheduling (Puffer, 1989). Scheduling allows for the possibility of prediction and the resolution of temporal uncertainty (McGrath & Rotchford, 1983; Schriber & Gutek, 1987). The traditional tools for organizing a day are an engagement calendar that schedules dates and a "to do list" that itemizes activities (Taylor & Mackenzie, 1986). However, without scheduling specific amounts of time to accomplish tasks, tasks tend to take longer (Taylor & Mackenzie, 1986). One solution may be to add project sheets to an individual's use of a time planner and a "to do" list. Project sheets spell out the specific components of larger projects, the dates by which these component tasks should be achieved by, and the blocks of time in which to work on these tasks (Taylor & Mackenzie, 1986).

It is also important for an individual to list everything that he or she is involved in because there needs to be time set aside for both essential activities and routine activities (Lakein, 1973). The individual should start by creating a task list. This is accomplished by listing in a 1-2-3 order everything that he/she has been involved in, all the responsibilities that they have, and all the tasks that they must do (Rice, 1984).

Once the task list and priority list have been developed, an individual should break the day into three parts: morning, afternoon, and evening, and attempt to schedule these activities accordingly (Rice, 1984). The individual needs to identify the most and least productive periods of the day. These time periods characterize the individual's

prime time (Bliss, 1976; Burka & Yuen, 1983; Soucie, 1986). The individual then needs to schedule the most important activities into these prime periods in order to get the most out of their prime time (Soucie, 1986). Schedules, like goals, need to be flexible in order to take into account unexpected problems (Lakein, 1973). Lakein (1973) suggests setting aside at least one hour per day for uncommitted time and trying to schedule absolutes early in the day to avoid panic.

Once a daily plan is accomplished, an individual must try weekly planning, where a daily plan is made up one week in advance and last minute changes made the evening before. The next logical step is the monthly and then seasonal plans (Rice, 1984).

Establishing New Time Habits

An individual may also examine their existing habits in order to gain a few extra minutes each day. One of the most conceivable areas to gain time from may be by waking up earlier in the morning (Rice, 1984; Stevens & Pfost, 1984). Significant time savings can be made by doing an entire set of similar tasks that have common priorities, such as reading and answering the mail all at one time. Conserving time is also important and can occur through the use of form letters, by controlling the length of meetings, or by delegating work (Schuler, 1979).

Empirical Studies of Time Management

Currently there is a dearth of research examining the effectiveness of time management in the exercise domain. In addition, although time management has been studied in the business, management and administrative fields, there is a lack of empirical research examining time management behaviors and the effectiveness of time management training programs. A literature review was conducted which examined time

management behaviors and the effectiveness of training programs in the business, management and administrative domains. Sources of the review included CD-ROM searches, cross-referencing of journal articles and hand searches of relevant journals. Key words used in the review included time management behaviors, time management training programs, planning, and daily planning. Studies were included in the review if they examined time management behaviors or the effectiveness of time management training programs.

Fourteen studies examining time management were located (see Appendix B). Six of the studies examined time management behaviors or practices (Britton & Tesser, 1991; Macan, 1994 [Study 2]; Macan, Shahani, Dipboye & Phillips, 1990; Simons & Galotti, 1992 [Study 1&2]; Williams, Verble, Price & Layne, 1995). Four of the studies examined the effectiveness of time management training programs (Macan, 1994 [Study1]; Macan, 1996; Orpen, 1993; Woolfolk & Woolfolk, 1986), a further two studies assessed a process model of time management (Macan, 1994 [Study 1&2]), and four studies examined the time management behaviors and practices utilized by specific populations. Approximately half of the studies examined the university population and half the studies examined the adult working population.

Results from the fourteen studies appear to show that the use of time management behaviors leads to a more effective performance. Moreover, individuals who have a preference for organization and planning appear to be more likely to utilize time management strategies. However, in the majority of time management studies (71%), the participants were measured on the time management attitudes and behaviors that they currently possessed and employed. There has been minimal literature examining the

effectiveness of time management training programs on individuals (28%). In addition, research prior to 1990 tended to focus on measuring the effectiveness of time management training as a uni-dimensional construct.

Woolfolk and Woolfolk (1986) investigated the effectiveness of a time management training program on pre-service teachers. The study consisted of 81 undergraduate pre-service teachers randomly assigned to one of three time management training conditions. Time management training consisted of the study of Lakein's 1973 book, "How to Get Control of Your Time and Your Life", a film on time management, lectures on time management, and two weeks of supervised time management training focusing on daily planning and time logs (experimental group 1 only). The participants were then examined on their performance on an intermediate deadline task, a delayed deadline task, a self-report of time management behaviors, and on performance during student teaching. Results from this study indicated that time management training had significant immediate and long-term effects on the time management behaviors of pre-service teachers. Both experimental groups were significantly more prompt with their work than the control, however, the two experimental groups did not differ from each other (Woolfolk & Woolfolk, 1986).

Macan et al. (1990) attempted to improve upon past research by examining the dimensionality of conventional time management behaviors. In addition, Macan et al. (1990) examined the correlates of time management behaviors in a sample of 288 university students. The participants were measured on the Time Management Behavior Scale (TMB), role ambiguity, role overload, stress, job and life satisfaction, and type A behavior pattern. The TMB was designed to assess the behaviors critical to the construct

of time management as defined by the popular literature. Time management performance was measured by both grade point average and self-reported ratings. Results indicated that self-reported time management was multi-dimensional. The TMB appeared to consist of four factors: goal setting and prioritizing, time management mechanics, perceived control of time, and preference for disorganization. Results showed that older subjects reported engaging more frequently in conventional time management behaviors, women were found to be better time mangers than men, those who indicated that they set goals and priorities tended towards the Type A behavior pattern, and individuals who indicated that they had previous time management training engaged more frequently in time management behaviors. Various time management behaviors were related to outcome variables and perceived control of time was identified as the strongest correlate. These findings indicate the importance of distinguishing between the different time management constructs (Macan et al., 1990).

Britton and Tesser (1991) examined the effect of time management practices on 90 university students' grades over their university career. The study was loosely based on the model developed by Britton and Glynn (1989). In this model, time management is separated into the following components: choosing goals and sub-goals, prioritizing goals, generating tasks and subtasks from the goals, prioritizing tasks, listing the tasks on a "to do" list, scheduling tasks, and carrying out the tasks. The students were measured on these time management components by the use of a 35 item questionnaire (TMQ). Intellectual ability was measured by total SAT scores and grade point average. Results from the study indicated that three main factors were associated with the time management questionnaire. These three factors were identified as short range planning,

time attitudes, and long range planning. The study showed that self-reports of time management were related to academic achievement. The effects of time management in this study were independent of SAT scores and the detected effects of time management were even stronger than the predictive effects of the SAT scores (Britton & Tesser, 1991).

Simons and Galotti (1992) assessed planning, prioritization, and the completion of daily activities for two samples of college aged students. In addition, the study attempted to examine the differences between good and poor planners. The first sample consisted of 88 college students while the second sample was composed of 48 undergraduates. Subjects were measured on their definition of planning with a planning questionnaire (GSPS), a goal setting task, an accomplishment schedule, and a follow-up questionnaire. Results from study one showed that seniors and females indicated more planning behaviors than freshmen and males as measured by their high scores on the GSPS. In addition, individuals who were classified as poor planners separated high priority goals from medium and low priority goals. Conversely, good planners separated high priority goals from low priority goals but did not distinguish between high priority and medium priority goals. Results from study two replicated most of the findings of study one. However, in contrast to study one, study two failed to show major behavioral differences between good and poor planners (Simons & Galotti, 1992).

Orpen (1993) tested the effects of a three day time management training program on 52 employees at an Australian manufacturing company. The time management training program consisted of lectures, group discussions, exercises and role plays. The program was run by professionals and focused on the ideas of Lakein (1991) and

Mackenzie (1978). The major topics covered by the time management training program were goal setting, learning time planning, setting priorities, dealing with interruptions, using filing systems, time diaries, and learning incoming information techniques. The participants were measured by a self-report measure of time management effectiveness which included both the attitudinal and behavioral effectiveness of the program. Results showed that the experimental subjects rated their time management effectiveness more highly than the control group. Among the experimental group, subjects who felt that the program had reached its' objectives rated their own individual time management effectiveness higher. In addition, there were correlations between both the attitudinal and behavioral time management effectiveness measure and the extent to which subjects felt that they had benefited from the program. Overall, the study seemed to indicate that the time management training program improved the subjects' time management attitudes and behaviors (Orpen, 1993).

Williams et al. (1995) attempted to determine the relationship between time management practices and personality type indices in 204 undergraduate students. The subjects were measured on the TMQ (Britton & Tesser, 1991), personality type, and social desirability. Results from this study indicated that all of the time management indices of the TMQ were related to having a planned, orderly, and controlled way of life. In summary, according to this study, good time managers seem to have a preference for planning, organization and sensory based information (Williams et al., 1995).

A 1994 study by Macan was the first study to empirically examine the relationship between time management behaviors and the TPB by investigating the relationships between the sub-scales of the TPB and perceived control over time. Macan (1994)

examined the structure of the TMB in an employed sample and then attempted to assess the linkages among time management training, time management behaviors, perceived control over time, and the behavioral outcomes of time management in a proposed process model of time management. This process model is the first empirical examination of the linkages between time management behaviors and perception of control over time. This model suggests learning time management skills and consequently engaging in time management behaviors will lead to a greater perception of control over time. Moreover, this greater perception of control over time should lead to decreased job induced tensions, decreased somatic tensions, increased job satisfaction, and increased job performance.

The study examined 353 employees with a mean age of 37 years. Forty-five per cent of the participants had previous time management experience while more than half the participants had read time management books. The participants underwent a half day of time management training that involved training in goal setting, prioritizing, making lists, scheduling and planning, organization, procrastination, and interruptions. The participants were then measured on time management behaviors, perceived control over time, stress, job satisfaction, and demographic variables. The results showed that three main factors accounted for 81% of the variance among subjects. These factors were goal setting and prioritizing, scheduling and planning, and preference for organization.

In contrast to earlier studies, the results from the Macan (1994) study showed that time management training was not found to be very effective in increasing the adoption of time management behaviors. The subjects' participation in the time management training program was only minimally related to their subsequent use of time management

behaviors. However, good support was found for the hypothesized process model of time management. In addition, the results showed that the participants who had set goals and priorities and had a preference for organization perceived themselves to have greater control over their time than those who did not set goals but had a preference for organization. Perceived control over time was related to positive outcomes: individuals who perceived themselves as having more control over their time reported fewer job induced tensions, fewer stresses, and greater job satisfaction than individuals who did not perceive themselves as having control over their time (Macan, 1994).

Macan (1996) examined the effects of time management training on time behaviors, attitudes, and job performance of 38 training participants and 39 control participants. Macan utilized the TMB (1990, 1994) to measure each participant on time management behaviors, as well as measuring participants on perceptions of control over time, job induced tension, somatic tension, and job satisfaction. Results indicated that subjects did not engage in more time management behaviors after participating in the time management training program. However, those individuals who did participate in the time management program did perceive more control over their time after the program. Thus, it is conceivable to imagine that Macan's (1994) process model of time management may be applicable to the exercise domain. Participating in a time management intervention may lead to increased time management behaviors, a decrease in the perception of time as a barrier to exercise, an increased perception of control over time, and an increase in exercise behavior.

In reviewing the literature on time management behaviors, four studies were located which examined the time management behaviors of specific populations. Two

studies examined time management techniques in relation to home based work (Hessing, 1994; Winter, Puspitawati, Heck & Stafford, 1993). Of these two studies, one study exclusively examined women (Hessing, 1994). One study examined the time management strategies of medical residents (Yoels & Clair, 1994) and another single study examined the work habits of successful general managers (Kotter, 1980).

Kotter (1980) examined the work habits of fifteen successful general managers. The results showed that most of the managers who were studied were classified as doing a "very good" job. The time management habits of these successful executives include the writing of a "to do list" for every day, in addition to prioritizing tasks and the creation of a daily schedule. In addition, the most effective executives developed agendas which were made up of connected goals and plans that addressed their long-, medium- and short-term responsibilities (Kotter, 1980).

Winter et al. (1993) analyzed two time management strategies which are commonly used to respond to the demands of home based work. These strategies were defined as the reallocation of personal time and obtaining additional help. Interviews were conducted with 899 "household managers." Results showed that in order to deal with time pressures, personal time was more likely to be reallocated than obtaining additional help. In addition, households of higher income and where home based work was a full time occupation were more likely to use time management strategies (Winter et al., 1993).

Hessing (1994) examined the concept of women's time management in their combined workloads of the household and the workplace. Fifty-one female staff members of a post-secondary institution between the ages of 20 and 64 were interviewed.

The participants also provided a self-reported, chronologically ordered list of household and workday tasks. Results of this study showed that the subjects combined workloads made time management necessary and therefore time was organized as a resource. In addition, the participants were actively involved in manipulating the sequence and duration of their tasks and activities. Manipulation of the activities was accomplished through prioritization, routinization and synchronization of activities, the extension and compression of the workday, scheduling the household, and preparing for contingencies (Hessing, 1994).

Yoels and Clair (1994) researched time management behaviors and time contingencies in a sample of 83 medical residents between the ages of 26 and 30. The medical residents were observed in the field and a total of 173 four hour observations with 83 different residents were conducted. Twenty-five per cent of the residents were randomly assigned to an in-depth interview. Results of the study showed that residents learned to manipulate and control the time schedule, deflect time complaints to others (delegate), maintain selective attention to matters, and use other residents for short cuts.

There were several common time management techniques identified by these specific populations. Some of the techniques identified were described as time manipulation, task delegation, prioritization, synchronization and routinization of activities, reallocation of personal time, goal setting, agenda making and the utilization of a time diary. Many of these strategies that were identified by dual career women, medical residents, general managers and home based workers parallel each other and the strategies more often identified in university student or business management samples.

Goal Setting

Time management has not been studied in the physical activity and exercise domain. However, goal setting, which has been identified as an important and necessary time management behavior and skill in both the popular and the empirical literature on time management, has been extensively studied in the exercise field. Therefore the examination of time management will progress with an exploration of goal setting theory and a review of the numerous exercise and goal setting studies.

Goal setting theory was developed by Locke and focuses on the controversy of why some people perform better on tasks than others (Locke, 1966, 1968). The basic assumption of goal theory is motivational and suggests that goals are immediate regulators of human action. Therefore, an individual's performance on a task is regulated by the conscious goal the individual is trying to achieve (Locke & Latham, 1985, 1991). A goal can be defined as what the individual is consciously trying to do (Locke & Latham, 1990) or the object or aim of an action (Locke, Shaw, Saari & Latham, 1981). Goals focus and direct the individual's activity and permit the individual to continuously measure performance results through internal processes of comparison (Locke et al., 1981).

Goals have two major characteristics: content and intensity. The content of a goal is the object or result being sought (Locke et al., 1981). The intensity of a goal pertains to the process of setting the goal or of determining how to reach it (Locke et al., 1981). Each goal characteristic can be further determined by two constructs. Goal content is determined by goal specificity and goal difficulty. Goal intensity is determined by goal commitment and goal proximity (Locke & Latham, 1991).

Goal Specificity

Goal specificity refers to how vague the goal is. Goal content can differ along a continuum from vague to clear and distinct. Locke and Latham (1985) argue that specific goals will direct activity more effectively and reliably than vague "do your best" goals. Vague goals are ambiguous and do not specify exactly what the individual is supposed to do or whether the goal has been obtained. Vague goals may lead to different outcomes than those expected, including outcomes below the individual's best performance (Locke & Latham, 1985). Goals may be made more specific by quantifying the behavior. According to goal theory, specific goals will lead to better performance than vague goals, no goals, or "do your best" goals.

Goal Difficulty

Goal difficulty refers to the relationship between the individual's ability to perform and the goal. Goal difficulty is usually measured along a continuum from easy to impossible. On average, the higher the absolute level of the goal, the more difficult it is for an individual to achieve the goal (Locke & Latham, 1991). Given adequate ability, a difficult goal should lead to better performance than an easy goal because individuals will try harder for more difficult goals. Specific and challenging goals should lead to a higher level of performance than vague but challenging goals, unchallenging goals, or no goals (Locke & Latham, 1991). Although there is no consensus as to what operationally defines a "difficult" goal, Locke (1991) suggests that specific goals should be set at a level at which no more than 10% of the subjects can reach. In addition, goals should not be unrealistic because continuing failure may result in decreased motivation and consequently decreased performance (Locke, 1991).

Goal Commitment

Goal commitment can be defined as the degree to which the individual is attached to the goal, considers the goal significant, and is persistent and determined to reach the goal (Locke & Latham, 1991). Goal commitment can operate as a direct and causal factor and moderator of performance. A high goal commitment leads to better performance. According to goal theory, problems with goal commitment are more likely to occur when the goals are very difficult because these types of goals often require more effort and are associated with greater risk of failure than easy goals (Locke & Latham, 1985). Goal commitment may also be affected by the degree to which the individual accepts the goal. For goal setting to be effective, the individual must accept the goal. Goal commitment may be improved by the individual's participation in setting the goals as participation will lead to more flexible goals and increased exercise participation (Martin et al., 1984; Wraith & Biddle, 1986). Ultimately, personal goals set in response to assigned goals may be better predictors of performance than assigned goals or participant set goals alone because individuals adjust goal assignments in accordance with their personal commitments and self-efficacy to create a goal that is both realistic yet challenging (Lerner & Locke, 1995).

Goal Proximity

Goal proximity refers to long-term, short-term and combination goals. According to goal theory, the use of both long-term and short-term goals will lead to better performance than long-term goals alone (Locke & Latham, 1991). Long-term goals alone may be too vague and distant to have much significant impact on the present (Locke & Latham, 1985). Similarly, highly specific short term goals may debilitate

performance as they do not allow for flexibility or situational constraints (Kirschenbaum, Humphery & Malett, 1981).

Goal Setting Literature Review

Goal setting in the exercise domain has not been as extensively studied as goals setting in the business and management area. A literature review was conducted which examined the effectiveness of goal setting in physical activity and exercise. Sources of the review included CD-ROM searches of Sport Discus and PsychLit, cross-referencing of journal articles and hand searches of relevant journals. Key words used in the review included goal setting, exercise, physical activity, difficult goals, goal difficulty, goal specificity and goal proximity. Studies were included in the review if they examined goals setting in relation to physical activity, exercise, endurance tasks, motor tasks, or utilized goal setting in a physical behavioral intervention program.

Three recent papers synthesizing and critiquing goal setting in the physical activity and exercise domains were found (Kyllo & Landers, 1995; Locke, 1991; Weinberg, 1994). In total, 22 studies involving goal setting and exercise were located (Appendix C). The appendix provides a description of the purpose of the study, the study design, the sample size and composition, the sample selection, the instruments and measures used in the study in addition to the study's main conclusions.

Overall, there are mixed results for the effectiveness of goal setting in exercise or physical activity. Of the 22 studies identified, 12 studies supported goal setting in the exercise setting while ten studies were not supportive. Weinberg and colleagues as a group were the principle investigators in 14 of the 22 studies identified and were

responsible for the ten studies that failed to show significant differences between goal conditions. This statistic may be significant because no other study failed to show a significant effect for goal setting.

Although there is an obvious need for further research on goal setting in exercise, the goal setting research does recommend that for goal setting to be most effective, goals should:

1) consist of both long term and short term goals
2) be realistic
3) be specific
4) be positive
5) be accepted by the participant
6) have timely feedback given

(Wraith & Biddle, 1986)

In addition, when choosing goals, individuals should ensure that the long-term goals are clear and that the short-term goals are specific and lead the individual towards the long-term goals. A list of potential barriers to the goals and creative solutions to these potential barriers may help to increase motivation and ensure adherence to the goals. Feedback about ongoing performance may be charted out and displayed (Wraith & Biddle, 1986). Wraith and Biddle (1986) also state that in order to increase commitment to goals, individuals should write the goals down, display the goals in a prominent place, and make the goals public as this creates reasonable pressure from self, friends, and relatives to achieve the goal.

Conclusions

The findings of the literature review may be summarized in the following ways: 1) time management has not been studied in the exercise domain even though lack of time or poor time management is the number one barrier to exercise; 2) time management skills consist of five comprehensive skill areas; time analysis, goal setting, prioritizing, scheduling and establishing new time habits; 3) the only time management skill that has been extensively studied in exercise is goal setting. The results from goal setting research suggest that to improve goal setting performance long and short term goals are required. The goals should be realistic, positive, specific, participatory, and made public. 4) Macan's (1994) process model of time management, which is based upon the theory of planned behavior, does have the potential for application to the exercise domain.

CHAPTER THREE

Methodology

This chapter will consist of a detailed description of the principal methodological elements of the study. These elements are the recruitment of participants, ethical considerations, a description of the intervention, and an illustration of the instruments that were utilized.

Recruitment of Participants

Participant recruitment began in December of 1997 with an initial focus on recruiting participants from the University of Alberta in Edmonton, Alberta through the use of posted advertisements in the common areas of campus buildings. Due to a slow recruitment response, recruitment was expanded in January of 1998 to include members of the Edmonton Club Fit Fitness Centers, Edmonton Young Men's Christian Associations (YMCAs), and the residents of Edmonton and the surrounding areas. Recruitment was conducted through the use of posted advertisements, e-mail notices, newspaper advertisements, word of mouth, and an article in the *Edmonton Journal* discussing the time management seminar. Low participation rates and slow participant recruitment in Edmonton forced recruitment to expand again in March of 1998. The focus of recruitment turned to Winnipeg, Manitoba and more specifically, to the Health Sciences Center campus. This recruitment attempt was conducted through e-mail, posted advertisements, and word of mouth with the aid of a liaison person from the on campus fitness center.

The time management course was advertised as a seminar conducted by a University of Alberta graduate student. The advertisement specified that participants would receive a free three hour seminar on time management for exercise in exchange for completing two questionnaire packages. The seminar was intended to help the participants improve the manner in which they managed their time in order to ensure that physical fitness was not neglected.

Potential participants who were interested in the time management training program or who wanted more information on the program were asked to contact the researcher by phone at the numbers provided. Potential participants who phoned the researcher were recruited to the study and then were randomly assigned to one of the two experimental conditions. Random assignment was attempted but many individuals brought along friends, did not attend their scheduled seminar or refused to be in the wait list control group. These referent individuals had to be assigned to a group according to availability and convenience.

Once the individuals were assigned to one of the two experimental conditions, the participants registered for a seminar time slot. The individuals assigned to the experimental group underwent the time management training program first. The individuals assigned to the wait list control group were offered the seminar four to five weeks after being assigned, once the experimental group's seminar had been completed. The experimental group completed the baseline questionnaire package before the seminar was conducted (either over the phone or at the seminar) and completed the follow-up questionnaire package over the phone one month after their time management seminar had been completed. The wait list control group completed the baseline questionnaire

package over the phone at the same time as the experimental group and then completed the follow-up questionnaire package one month later, immediately before their time management seminar was conducted (either in-person or over the phone).

Contrary to initial expectations and due to the lack of interest and the slow recruitment, several time management seminars were offered. Fifteen time management seminars were offered in Edmonton and two seminars were delivered in Winnipeg.

Ethical Considerations

Prior to data collection, ethical approval for the study was obtained from The Faculty of Physical Education and Recreation Ethics Committee. Immediately prior to questionnaire administration, a verbal description of the study was provided to each participant. The description included the general purpose of the study (e.g. "I am looking at people's familiarity with time management and the effect this familiarity has on exercise"), the responsibilities of the participants, and an overall description of the questionnaires. It was stressed that participation in the time management seminar and the study was voluntary, that participants could withdraw from the study at any time, for any reason, without prejudice, and that the information gathered from the questionnaires would have important practical uses. The participants were assured of anonymity and it was also stated that the gathered data would remain strictly confidential. Each participant was asked for verbal consent over the phone and in addition was asked to sign a consent form when he or she attended the time management seminar to which he/she was assigned. A copy of the consent form is included in Appendix D.

Intervention Description

The time management course consisted of a three hour seminar with a one week, a two week, and a one month follow-up phone call. The seminar examined the time management concepts of planning, time logs, goal setting, prioritizing, scheduling, and daily time plans. As well, current exercise behaviors and exercise behavior goals were explored. Participation in the seminar included a time management workbook. The seminar was a combination of lecture and discussion format.

Following the seminar, the participants were reminded of the one week, two week, and one month follow-up phone calls. Participants were also provided with the researcher's phone number and were encouraged to call if they required additional help or had any further questions regarding time management.

All participants who participated in the time management seminar received follow-up phone calls regardless of the group they were assigned to. The one week and two week follow-up phone calls were short calls, intended to help the researcher maintain contact with the participants until after the one month follow-up time period was over. The phone calls were also intended to help the experimental participants apply the time management skills they had learned to their lives and to provide an opportunity for the participants to ask further questions and discuss their progress. For participants in the experimental group, the follow-up questionnaire was administered during the one month follow-up phone call.

Instruments

The instruments, which can be found in Appendix E and are described in the following paragraphs.

Demographic Questionnaire (DQ)

The demographic questionnaire was designed to obtain information about the gender, age, marital status, employment, education, and previous time management experience of the participants. The demographic questionnaire was administered either over the phone by the researcher or self-administered immediately prior to the time management seminar.

Time Management Behavior (TMB) Questionnaire

The TMB scale developed by Macan (1996; 1994) and Macan et al. (1990) presently consists of 34 separate time management behavior items intended to measure the extent to which various time management activities are used, rather than the participants' evaluation of the effectiveness or the appropriateness of the behaviors. The TMB consists of four sub-scales: goal setting, mechanics of time management, preference for organization, and perceptions of control over time. Items are rated on a 5-point Likert-type scale ranging from seldom true (1) to very often true (5). Negatively worded items are used to avoid a response set. Each sub-scale score is obtained by first reverse scoring the negatively worded items, and then summing the associated items scores. A total TMB score is obtained by summing the four sub-scales scores.

The internal consistencies reported by Macan et al. (1990) were based on a 46 item scale as compared to the current 34 item scale. The 46 item TMB consisted of 15

items for Setting Goals and Priorities (SGP), 13 items for Mechanics of Time Management (MTM), 5 items for Preference for Organization (PFO) and 13 items for Perceived Control Over Time (PCT).

The first sub-scale measures SGP and now consists of ten items (e.g. "I review my goals to determine if they need revising"). Macan et al. (1990) found the coefficient alpha value to be 0.83 for this sub-scale in a highly homogeneous university undergraduate student sample. The second sub-scale measures MTM and is now comprised of eleven items (e.g. "I make a list of things to do each day and check off each task as it is accomplished"). For this sub-scale, Macan et al. (1990) reported the coefficient alpha value to be 0.62. Preference for organization, (PFO), is the third sub-scale that now consists of eight items (e.g. "My workdays are too unpredictable for me to plan and manage my time to any great extent"). Macan et al. (1990) found the coefficient alpha to be 0.60 for this sub-scale. The fourth sub-scale of the TMB currently is comprised of five items that assess the participants' perceptions of control over their time, (PCT), (e.g. "I feel in control of my time"). For this sub-scale, Macan et al. (1990) found a coefficient alpha value of 0.69. Overall, Macan et al. (1990) found a moderate internal consistency for the TMB (α=0.68).

TPB Questionnaire (TPBQ)

This questionnaire incorporates separate measures of three constructs from the theory of planned behavior (Ajzen, 1985; 1988; 1991). The constructs of control beliefs (PB), perceived behavioral control (C), and intention (I) are assessed with reference to exercise behavior.

Control Beliefs.

The control beliefs were drawn from the top seven barriers to exercise identified by Canadians from 18 to 24 years and reported in the 1995 Physical Activity Monitor (CFLRI, 1996). These barriers to exercise are a) lack of time, b) lack of energy, c) lack of motivation, d) prohibitive cost of exercise, e) lack of facilities or inadequate facilities, f) feeling ill at ease when exercising, and g) health reasons such as illness or injury. Participants are asked to rate their confidence in regularly exercising despite each barrier on a seven point Likert-type scale ranging from 1 (extremely unlikely) to 7 (extremely likely). The statement that preceded each control belief was drawn from Courneya (1995) and was phrased as follows: "I am confident that I can exercise regularly during the next four weeks even if..." These responses are then summed to obtain a total control beliefs (barriers to exercise) score. This questionnaire does not take into account the perceived power of the control belief to affect the performance of the behavior, as recommended by Ajzen (1991). However, Courneya (1995) followed this procedure and found an alpha level of 0.90 for similar exercise barrier items.

Perceived Behavioral Control.

Perceived behavioral control was measured by three questions following the guidelines suggested by Ajzen and Madden (1986). The three questions are rated on a seven point Likert-type scale. The three questions are: (a) "For me to exercise regularly over the next four weeks will be..." with answers ranging from 1 (extremely easy) to 7 (extremely difficult), (b) "If I wanted to, I could easily exercise regularly during the next four weeks" with responses ranging from 1 (strongly disagree) to 7 (strongly agree), and (c) "How much control will you have over exercising regularly during the next four

weeks" with responses ranging from 1 (very little control) to 7 (complete control). The first control statement was reverse scored and then the three control statements were summed to obtain a total control score. Courneya et al., (1997) measured perceived behavioral control in a similar manner and found the coefficient alpha for the three item scale to be 0.60.

Intention.

Exercise Behavior Intentions were measured using four different items. The specific statements for each item were drawn from past studies by Courneya (1995, 1994), Courneya and McAuley (1993), and Courneya et al. (1997). The individual items were (a) "I intend to exercise regularly during the next four weeks," with responses on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree); (b) "I intend to exercise at least _____ times per week during the next four weeks;" (c) "I intend to exercise with the following regularity during the next four weeks," with responses on a 7-point scale ranging from not at all to every day; and (d) "I intend to exercise at least three times per week over the next four weeks," with responses on a 7-point scale ranging from definitely to definitely not. Responses from each of the four statements were summed to obtain a total exercise intention score. Courneya (1995) reported an alpha level of 0.94 for a similar intention scale.

Exercise Behavior (EB)

Exercise behavior was measured using a self-report measure of exercise and physical activity. The self-report measure utilized was the leisure score index (LSI) of the Godin's Leisure Time Exercise Questionnaire (GLTEQ; Godin, Jobin, & Bouillon, 1986; Godin & Shepard, 1985). This questionnaire consists of three questions which inquire

about the average number of times per week that individuals participate in at least twenty minutes of strenuous, moderate, and mild leisure time exercise. Total exercise was calculated by weighting the frequency of each category of exercise by the estimated intensity as measured in METS and then summing for the total score. The calculation is described as: (3 x frequency of mild exercise) + (5 x frequency of moderate exercise) + (9 x frequency of strenuous exercise). The GLTEQ has been validated by Jacobs, Ainsworth, Hartman and Leon (1993) in an evaluation of ten commonly used physical activity/exercise questionnaires. This evaluation found the GLTEQ to be a reliable but brief, easily administered instrument that possessed concurrent validity based upon several criteria including objective activity monitors and fitness indices (Jacobs et al., 1993).

CHAPTER FOUR

Results and Discussion

To answer the research questions presented in chapter one, the analyses were completed in three sequential steps. First, statistics descriptive of the biodemographic characteristics of the control and the experimental groups at both baseline and at follow-up were obtained. This allowed for comparison of the groups in terms of these characteristics. Second, the internal consistency of each questionnaire was determined using Cronbach's alpha. Lastly, Multivariate Analysis of Covariance (MANCOVA) was completed to determine whether or not there were statistical differences between the control and experimental groups on the dependent variables considered. An alpha level of 0.05 was used for all statistical tests. The presentation of the results is divided into three sections, with each section corresponding to a stage of the analyses.

Descriptive Statistics

Initially, 136 individuals volunteered for the study. Of this group, 64 participants were assigned to the wait-list control group and 72 were assigned to the experimental group. The assignment was not random. Several individuals volunteered at one time and did not want to be separated. Consequently, while the group of individuals were randomly assigned, some individuals were not.

Eight control group participants and 20 experimental group participants did not complete the final questionnaire. As a result, complete data sets were available for 56 participants in the wait-list control group and 52 participants in the experimental group.

Table 3-1

Demographic Characteristics of Sample

Characteristic		Participant Group	
		Control	Experimental
Location	Edmonton	17 (30.4)	18 (34.6)
	Winnipeg	39 (69.6)	34 (65.4)
Gender	Male	23 (41.1)	8 (15.4)
	Female	33 (58.9)	44 (84.6)
Age	18-29	17 (30.9)	12 (25.0)
	30-39	14 (25.5)	13 (27.1)
	40-49	15 (27.3)	10 (20.8)
	50-59	9 (16.4)	13 (27.1)
	Mean (SD)	36.9 (11.4)	39.4 (10.4)
Marital Status	Never Married	17 (30.4)	12 (23.5)
	Married	29 (51.8)	28 (54.9)
	Common Law	5 (8.9)	4 (7.8)
	Divorced/ Separated	5 (8.9)	7 (13.7)
Education	High School	6 (10.7)	8 (15.7)
	Some University/College	10 (17.9)	10 (19.6)
	Completed University/College	35 (62.5)	24 (47.1)
	Graduate School	5 (11.2)	9 (17.6)
Employment	Homemaker	0 (0)	2 (3.9)
	Part-time	6 (10.7)	6 (11.8)
	Full-time	41 (73.2)	38 (74.5)
	Retired	1 (1.8)	1 (2.0)
	Temporarily Unemployed	1 (1.8)	0 (0)
	Student	7 (12.5)	4 (7.8)
Time Management	Yes	20 (44.4)	13 (37.1)
	No	25 (55.6)	22 (62.9)

Note: Numbers in parentheses are percentages.

As shown in Table 3-1, slightly more than two thirds (69.6%) of the control group were recruited from Winnipeg; the remainder (30.4%) were from Edmonton. Over half (58.9%) of the participants in the control group were female. The participants ranged in age from 18 to 58 years with a mean of 36.92 years (SD=11.41 years). Slightly more than half (51.8%) the participants were married, an additional five (8.9%) more were in common law marriages, an equal number, 5, (8.9%) were separated or divorced, and 17 (30.4%) had never married. Over half (62.5%) of the participants had completed university or college, ten (17.9%) had some university or college education, five (11.2%) more had completed graduate school, and another 6 (10.7%) had completed high school. Close to three-quarters (73.2%) of the participants were employed full-time, six (10.7%) were employed part-time, seven (12.5%) were students, one (1.8%) was retired and another one (1.8%) was temporarily unemployed. Almost half (44.6%) of the control group participants had no previous time management experience.

Similar to the control group, over two thirds (65.4%) of the experimental group were recruited from Winnipeg; the remainder (34.6%) were from Edmonton. The experimental group consisted of primarily female volunteers (84.6%). The participants ranged in age from 21 to 59, with a mean of 39.42 years, (SD=10.93 years). Over half (54.9%) the participants were married, four (7.8%) were in common law marriages, seven (13.7%) were separated or divorced, and 12 (23.5%) had never married. Almost half (47.1%) of the participants had completed university or college, ten (19.6%) had completed some university or college, nine (17.6%) had completed graduate school, and eight (15.7%) had completed high school. Almost three-quarters (74.5%) of the participants were employed full-time, six (11.8%) were employed part-time, four (7.8%)

were students, two (3.9%) were homemakers, and another one (2.0%) participant was retired. Almost half the participants, (22; 42.3 %) had no previous time management experience.

The demographic variables were examined statistically to determine if any significant differences between groups existed at baseline. Given the nature of the variables, chi-square tests were utilized and the results of these analyses are presented in Table 3-2. However, it was impossible to statistically analyze the employment variable since there was less than the minimum required cell size of five. However, visual observation of the two groups indicated an essentially identical distribution for this variable.

The Chi-square test revealed significant group differences for gender, ($\chi 2 = 8.693$, $p<.05$). The proportion of males in the control group ($n=23$) was significantly greater than the proportion of males in the experimental group ($n=8$). Chi-square tests conducted on the remaining variables showed that the groups did not differ significantly on any other demographic variable.

Internal Consistency

The internal consistencies of the instruments utilized in this study were assessed at baseline and again at follow-up. In each case, Cronbach's alpha (1951) was determined. The results are presented in Table 3-3. The internal consistencies of the TMB were assessed for each of the four individual sub-scales and for the overall TMB scale. The coefficient alphas of the sub-scales ranged from 0.64 to 0.86 at baseline, and 0.70 to 0.89 at follow-up. Overall, a moderate internal consistency was found at both baseline (0.64) and follow-up (0.69), using Cronbach's stratified alpha.

Table 3-2

Differences Between Groups On Baseline Demographic Variables

Variable	Test	Statistic	Df	Significance
Gender	Chi-square test	8.693[a]	1	0.003*
Age	Independent t-test	1.126	101	0.263
	Chi-square test	2.161[a]	3	0.540
Marital Status	Chi-square test	1.025[a]	2	0.599
Education	Chi-square test	3.253[a]	3	0.354
Previous Time Management	Chi-square test	0.433[a]	1	0.510
Location	Chi-square test	0.223[a]	1	0.637

* = $p<.05$

Note: [a] denotes cells which have expected count more than five.

Table 3-3

Psychometric Characteristics of Baseline TMB, Perceived Barrier, Control , and Intention Scales

Scale	# of items	Mean	SD	ρ_{xx}	SEM
TMB					
SGP					
Baseline	10	33.4	7.60	0.86	2.70
Follow-up	10	35.18	7.50	0.89	2.40
MTM					
Baseline	11	33.30	9.19	0.82	3.76
Follow-up	11	35.96	9.20	0.84	3.51
PFO					
Baseline	8	31.87	5.53	0.73	2.71
Follow-up	8	32.19	4.97	0.70	2.52
PCT					
Baseline	5	15.23	3.93	0.64	2.11
Follow-up	5	16.14	3.83	0.70	1.87
Total					
Baseline	34	113.80	19.07	0.64[a]	6.55
Follow-up	34	119.47	19.32	0.69[a]	6.03
PB					
Baseline	7	3.55	1.50	0.85	0.14
Follow-up	7	3.44	1.36	0.81	0.13
Control					
Baseline	3	4.91	1.48	0.85	0.14
Follow-up	3	5.01	1.29	0.75	0.12
Intention					
Baseline	4	4.71	1.53	0.88	0.15
Follow-up	4	4.63	1.56	0.91	0.15

[a] Cronbach's stratified alpha.

The overall internal consistency values found in this study are almost identical to the overall value of 0.68 which was reported by Macan et al. (1990). In this study, the internal consistency values for MTM were found to be higher at both baseline (0.82, SD = 9.19) and follow-up (0.84, SD = 9.20) than the internal consistency value identified by Macan et al. (1990) (0.62, SD = 9.81). The discrepancy in these findings are not due to differences in variances among the samples in the two studies as the standard deviations are almost identical. However, the differences may be attributable to differences in the populations sampled. Macan et al. (1990) reported internal consistency values for a homogeneous university sample as compared to the more heterogeneous adult sample found in this study. It is known that heterogeneous samples help to contribute to higher internal consistencies and higher reliabilities.

Group Comparisons

Due to the lack of randomization, a Multivariate Analysis of Variance, (MANOVA) was conducted to determine if there were any significant differences between the treatment and control groups on the TMB, TPB, and EB variables at baseline. Results from the MANOVA indicated an overall significant difference between the groups ($F(10,97)=6.787$; $p<.05$). Follow-up univariate results (Hummel & Sligo, 1974) revealed that the two groups differed significantly on the variables of Baseline Setting Goals and Priorities (BSGP), ($F(1,106)=5.969$; $p<.05$), Baseline Perception of Control Over Time (BPCT), ($F(1,106)=22.353$; $p<.05$), Baseline Intention to Exercise (BI), ($F(1,106)=11.048$; $p<.05$), and Baseline Strenuous Exercise (BStrenEx), ($F(1,106)=9.827$; $p<.05$). At baseline, the wait-list control group reported setting goals and priorities (BSGP) significantly more ($M=3.5058$, $SD=0.8008$) than the experimental

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Results from the MANCOVA using the two covariates, BTMQ and BI indicated an overall significant difference as measured by Wilk's Lambda ($F(10,95)=2.337$, $p<.05$). Unfortunately, it was noted that the variance-covariance matrices of the dependent variables in each group were not equal (Box M test; $p<.05$).

According to Glass and Hopkins (1996), the assumptions associated with analysis of variance are relatively robust to the violations of the assumptions of homogeneity of covariance when the groups have equal numbers of participants. Therefore, the sample size of the two groups in this study were equalized by eliminating the extreme outlier on the intention variable and by randomly eliminating five participants from the control group and then repeating the MANCOVA. This process was completed five times. In all cases, the MANCOVA still showed these groups to have significant differences as measured by Wilk's Lambda (see Table 3-4). Thus, because there was no change in the results with equal sample sizes, a decision was made to continue the analysis with all of the 108 participant data. Follow-up univariate analysis (Hummel & Sligo, 1974) indicated significant differences between the control group and the experimental group on the variable follow- up Mechanics of Time Management (AMTM), $F(1,106)=.009$, $p<.05$. As shown in Table 3-5, the adjusted means were 3.0927 for the control group and 3.4562 for the experimental group. The variable AMTM is one of the four sub-components of the TMQ and deals specifically with skills such as making lists, scheduling, and prioritizing. The experimental group reported using significantly more mechanics of time management skills than the wait-list control group at follow-up. This result may be an indication that the experimental group learned something about the

Table 3-4

MANCOVA Results Over Five Random Repetitions

Repetition	Box's M	Wilk's λ	F	Df	Sig
1	104.101*	0.815	2.022*	10,89	0.040
2	84.013*	0.786	2.424*	10,89	0.013
3	95.803*	0.783	2.471*	10,89	0.012
4	107.398*	0.814	2.030*	10,89	0.039
5	94.432*	0.804	2.173*	10,89	0.027

* $p < .05$

mechanics of time management during the time management seminar and had begun to apply these skills to their lives.

The experimental group also differed significantly from the control group on the amount of strenuous exercise reported by participants at follow-up (AStrenEx), $F(1,106)=8.929$, $p<.05$. The adjusted means were 1.9539 for the control group and 0.9054 for the experimental group. Strenuous exercise was defined as "exercise that made the heart beat rapidly" and was characterized by activities such as running, cross-country skiing, and heavy weight training. After the one month follow-up period, the control group reported strenuously exercising significantly more than the experimental group despite the fact that the experimental group had received training in time management. This was an unexpected finding.

Table 3-5

Adjusted Means for Dependent Variables at Follow-up

Dependent Variables	Group	Adjusted Means
ASGP	Control	3.5277
	Experimental	3.5068
AMTM*	Control	3.0927
	Experimental	3.4562
APFO	Control	3.9676
	Experimental	4.0793
APCT	Control	3.2961
	Experimental	3.1379
APB	Control	3.4609
	Experimental	3.4075
AC	Control	5.2970
	Experimental	4.8628
AI	Control	4.5118
	Experimental	4.7316
AMildEx	Control	3.6135
	Experimental	2.7240
AModEx	Control	2.6796
	Experimental	2.0758
AStrenEx*	Control	1.9539
	Experimental	0.9054

*Difference between adjusted means $p<.05$.

CHAPTER FIVE

Summary, Limitations, Recommendations, and Conclusions

This chapter consists of two sections. The first section includes a summary of the study, data analyses, and hypotheses. The second section includes a discussion about the limitations of the study, the recommendations that have resulted from the study, and the study conclusions.

Summary of Study

The purpose of this study was to examine the effectiveness of a time management training program on participants' time management behaviors, their perceived barriers and perceptions of control over exercise, and their exercise behaviors. One hundred and eight adult volunteers between the ages of 18 and 59 participated in this study. Random assignment of participants to either the wait-list control or experimental groups was attempted but was unsuccessful due to groups of participants (friends) wanting to stay together rather than be randomly assigned. Ultimately, there were 56 participants in the wait-list control group and 52 participants in the experimental group. Participants in the experimental group underwent the time management training program first. These participants were administered a short questionnaire at baseline, attended the three hour time management seminar, and were then administrated the questionnaire again after a one month follow-up. Participants in the wait-list control group were administered the questionnaire at baseline, followed for one month, administered the questionnaire again, and then participated in the time management seminar.

Summary of Data Analyses

Demographic data were analyzed statistically using Chi-square tests to discover if significant differences existed between the wait-list and experimental groups at baseline. Results showed that the two groups differed significantly only on the variable of gender. The wait-list control group contained a significantly greater proportion of males than the experimental group.

Next, a MANOVA was conducted to examine if significant differences existed at baseline between the two groups on the questionnaire variables. Results showed that there was a significant overall difference between groups. Follow-up univariate results indicated significant differences between the groups on the variables of BSGP, BPCT, BI, and BStrenEx. The wait-list control group had significantly higher BSGP and BStrenEx scores than the experimental group. Conversely, the experimental group had significantly higher BPCT and BI scores than the wait-list control group. In order to control for these differences, a MANCOVA was used to analyze the follow-up data, covarying on the variables BTMQ and BI. Results of this analysis showed an overall significant difference between groups. Follow-up univariate analyses showed significant differences between groups on the variables AMTM and AStrenEx. The experimental group reported using significantly more AMTM skills than the wait-list control group at follow-up. Conversely, the wait-list control group reported engaging in significantly more strenuous exercise than the experimental group at follow-up.

Summary of Research Hypotheses

The results of the study do provide some preliminary information about exercise behavior and time management even though the data analyses summary indicates that the results were somewhat contrary to the four predicted hypotheses. The first hypothesis was that the experimental group participants would adopt and utilize more time management skills than the wait-list control group. The first hypothesis was the only hypothesis to be somewhat supported by the results of the study. The experimental group adopted and reported utilizing mechanics of time management (AMTM) significantly more than the wait list control group at follow-up. These skills are characterized by statements like "I keep a daily log of my activities," "I schedule activities at least one week in advance," and "I write notes to remind myself of what I need to do." It appears that a time management training program may be effective for teaching individuals time management skills as related to the MTM. The results do not provide support for any other sub-component of time management as the two groups did not differ significantly on their reported use of Setting Goals and Priorities, Preference For Organization, or Perceived Control Over Time.

The second and the third hypotheses were not supported by the findings of the study. The second hypothesis was that when compared to the wait list control group, the experimental groups' use of time management skills would result in reduced perceptions of time as a barrier to exercise. The two groups did not differ significantly on perceptions of time as a barrier to exercise at follow-up. The third hypothesis was that the reduction of lack of time as a barrier to exercise for the experimental group would result in corresponding greater perceptions of control over exercise than the control

group. Again, this hypothesis was not supported by the results. The two groups did not differ significantly on their perceptions of control over exercise at follow-up.

The fourth and final hypothesis examined whether the higher perceptions of control over time experienced by the experimental group would lead to more frequent exercise behaviors for the experimental group. This hypothesis was not supported by the results of the study. Furthermore, the results of the study showed that the wait list control group reported more frequent strenuous exercise (AStrenEx) than the experimental group at follow-up. The finding that the control group strenuously exercised significantly more than the experimental group was unexpected. This result may be linked to the fact that true random assignment did not occur and that the groups were significantly different at baseline. However, there was no indication that the frequency of strenuous exercise reported by the wait list control group was influenced in any way by their perceptions of control over time.

Limitations and Recommendations

Due to the exploratory nature of the study there are many limitations to the study and consequently, there are also many recommendations for future studies that can be made. The results of this study suggest that the effectiveness of a time management training program for exercise may be questionable. It is possible that time management training may not be a good intervention for exercise participation and adherence. However, the theory of planned behavior (Ajzen, 1985; 1988; 1991) provides strong theoretical support for the use of an intervention, such as time management training, to increase exercise participation and adherence. The theory of planned behavior incorporates the concept of perceived behavioral control which describes individuals'

perceptions of control as indirectly influencing the individuals' performance of behaviors (Ajzen, 1985; 1988; 1991). According to the theory of planned behavior, a time management training program for exercise should help individuals to participate in and adhere more frequently to exercise programs by reducing the individuals' perceptions of time as a barrier to exercise. Moreover, lack of time has been shown to be a barrier to exercise. The statement "lack of time for exercise" was reported by a survey of Canadians, from the ages of 18-64, to be their number one barrier to exercise (CFLRI, 1996). Even though the research hypothesis that time management would be an effective intervention for exercise participation and adherence was not supported in this study, future research should continue to focus on this area.

A second potential explanation for the lack of support found for the effectiveness of the time management training program could be that lack of time is not a real barrier to exercise, that it is only an excuse given to mask a lack of motivation to exercise. No matter how effective a time management training program may be, it will not be able to help change people's attitudes towards exercise, or to change their exercise habits if the problem is not a real lack of time for exercise. Researchers need to probe people further when they question their reasons for not exercising. We need to know what people mean when they say that they have no time. The value of exercise is relative; for some individuals exercise is very important but for others exercise is not as important. The issue may be a value of exercise issue and not a lack of time issue. Research should continue to focus on helping individuals increase the value that they place on exercise. Despite this, a time management training program should still be an effective exercise intervention for the proportion of the population who consider exercise to be an important

or a moderately important value. As long as exercise is valued, time management training should help participants to organize their time better so that they can find the time to exercise. Future research should examine this angle by probing further into what the public means when they state lack of time as their number one barrier to exercise.

A third problem with this research study may have been that the scale used to measure time management skills and behaviors was fairly generic. The scale contained items that were not at all applicable to exercise. For example, the questions often referred to "work" or "workdays" (Macan 1994, 1996; Macan et al., 1990). It is possible that the measure did not survey time management with respect to exercise. Perhaps an exercise related time management training program requires a more specific exercise orientated measure of time management. Results from the study showed that the experimental group did report more mechanics of time management behaviors after time management training than the control group. Thus, the time management training program was effective for this one time management construct. However, this finding did not translate into fewer barriers to exercise, better perceptions of control over time, or more frequent self-reported exercise for the experimental group participants than the wait list control group. The TMB scale may have been sensitive to generic time management behaviors but not sensitive enough to time management for exercise behaviors. Future research could focus on creating a time management scale directly related to exercise.

A fourth and further explanation for the lack of findings may be embedded in problems with research design. Seven research design issues became apparent throughout the course of the research study

First, there were problems with recruitment of participants from Edmonton and the surrounding areas. The recruitment attempts from the University of Alberta campus were not very successful. This could be because this recruitment was conducted in January of 1998 when many students, faculty, and staff had just returned to campus after the holidays. The recruitment attempts aimed at the Club Fit members were also not as successful as expected. This may have been due in part to the reluctance of some Club Fit members to attend a seminar outside of their Club Fit location necessitated by the fact that the Club Fit locations did not have the facilities available to hold a seminar. The recruitment attempt aimed at the Edmonton YMCA organization was not at all successful. This is believed to be due to a lack of response from the liaison people, the fact that the seminar was not offered by YMCA individuals, and the lack of promotion by the YMCA organization. The best response in Edmonton and the surrounding areas came from the newspaper article about the seminars which was published in the *Edmonton Journal*. Conversely, there was an extremely successful recruitment response from the Health Sciences Center campus in Winnipeg, Manitoba. The difference in response rates between the Edmonton and the Winnipeg recruitment attempts may have been due to the fact that the Winnipeg recruitment was promoted extremely well by a very interested and responsive liaison person within the exercise facility. The facility in Winnipeg was brand new, and the organizers were looking for help promoting and marketing their facility. Another potential factor may have been the time of year. Recruitment in Winnipeg occurred during the spring whereas recruitment in Edmonton occurred primarily during the winter months.

A second problem was centered on the assignment of individuals to the experimental and wait-list control groups. True random assignment to groups was unsuccessful due to the extremely slow recruitment of participants, financial constraints, and time restraints. Random assignment was attempted but many individuals did not attend their scheduled seminar. This resulted in extremely small seminar classes due to the low attendance rates and led to some cancellation and rescheduling of seminars. In addition, many potential participants became aware of the seminar through friends who had already completed the seminar and thus were not willing to wait a month to take the seminar when they were randomly assigned to the control group. Despite these problems, random assignment was still attempted with all individuals even though many of the individuals were eventually assigned to a group according to their availability. The serious random assignment problems evident in this study may account for the differences between the two groups at baseline on gender, BSGP, BPCT, BI, and BStrenEx.

The third research design issue concerns the sampling bias that occurred with the volunteer participants. The volunteers were assumed to be more motivated to participate and to learn about time management than the average person. This assumption was based upon the fact that the volunteers had to make the decision to contact the researcher for more information in order to take the time management course. This recruitment procedure may have resulted in a sampling bias of high level of motivation among the participants. However, this sampling bias was thought to be acceptable because in order for the time management training program to be effective, the participants had to want to take the course to improve their time management skills. In addition, the individuals had

to intend to exercise in order to apply the acquired time management skills to their life for this purpose.

This study required individuals who had problems finding the time to exercise. The fourth limitation to this study was that there was no control for the variable time as a perceived barrier to exercise among the participants. The hypothesis was that individuals who considered lack of time to be a serious barrier to exercise would find the time management training program an effective exercise intervention. However, all individuals who professed an interest in the seminars, regardless of their perceptions of time as a barrier to exercise, were included in the study. The participants were not measured on the perceived barriers variables until the baseline questionnaire. In addition, the perceived barriers scale that was utilized in this study measured the top seven barriers to exercise. Lack of time as a perceived barrier to exercise was only one item on this seven item scale. Future studies should attempt to examine the effectiveness of a time management training program on individuals who score highly on a scale that measures time as a perceived barrier to exercise.

The fifth research design problem was the utilization of a self-report measure of exercise frequency and intensity. It is possible that participants in both the wait-list control group and the experimental group did not accurately record their exercise behavior patterns. In the future, it may be more appropriate to use an objective measure of exercise behavior such as attendance records, in conjunction with a self-report measure, to monitor exercise behavior.

The sixth possible explanation for the lack of supportive findings is that the intervention may not have been intensive enough. It is possible that the time

management training seminar was too short in duration. Perhaps future studies should conduct the seminar over an extended period with training sessions and homework assignments devoted to each construct. Alternatively, the time management seminar may have had a follow-up period that was too short. A four week follow-up period may be too short a period of time to expect to see changes in behaviors. In future studies, training sessions and follow-up periods could be longer in order to provide participants more time to practice and apply new behaviors.

The last research design problem noted was the effect of the length of the follow-up period on participant attrition. The study involved a one month follow-up period. At the end of this period, both the experimental and the control group completed the follow-up questionnaire. The follow-up period became a problem with the experimental group in particular due to participants failing to complete the follow-up questionnaires on time. It was extremely difficult to contact many of the participants once they had received the time management seminar. Many participants had to be called several times before contact was made and the follow-up questionnaire completed. Thus, not all experimental follow-up questionnaires were completed at exactly four weeks post-seminar. Not only did the follow-up period lead to problems with participants completing the follow-up questionnaires on time but also to problems with attrition from the study. The experimental group had more drop-outs (n= 20) than the control group (n=8). One possible reason for this differential and higher attrition rate in the experimental group is that the wait list control group had not yet taken part in the time management seminar at the time of the follow-up questionnaire completion. The experimental group had already

completed the seminar and thus may not have been as compelled as the wait list control group to finish the questionnaire portion of the study.

Conclusions

The results of the study did not provide the expected support for the effectiveness of a time management training program for exercise. There were significant problems with this study and several limitations were identified, including the lack of random assignment. Unfortunately, the existing limitations severely restrict the generalizability of the study results.

Despite the limiting factors, the present research is a first step towards an intervention aimed directly at influencing the perceived exercise barrier of lack of time. Canadians from the ages of 18-65 report lack of time as their number one barrier to exercise (CFLRI, 1996), yet no published studies to date have attempted to tackle this barrier directly. A time management training program appears to hold some promise at least as a tool for teaching time management behaviors. Future research should continue to focus on the use of a time management training program for exercise with randomized samples and a more specific measure of exercise related time management behaviors.

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APPENDIX A

Reference	Purpose	Study Design	Sample Size & Composition	Sample Selection	Instruments/ Measures	Main Conclusions
Courneya et al., 1997	To examine the relationships among the TPB, stages of change, and exercise behavior over a three year period.	Longitudinal Prospective 3 Year follow-up of a cohort sample.	131 Ss Mean Age = 71.5 56% Female 45 % Ss married	Volunteers from the Kirby Center (Calgary, Alberta)	1. *TPB Constructs:* a) Subjective norm measured by single item. b) Attitude measured by 8 items c) Perceived behavioral control measured by 3 questions d) Intention measured by 4 different scales. 2. *Exercise Stage:* measured using a questionnaire adapted from Marcus et al., (1992). 3. *Exercise Behavior:* Godin Leisure Time Questionnaire (Godin & Shephard, 1985)	1. Path analyses showed that TPB constructs were significant predictors of exercise stage, intention mediated the effects of TPB constructs on exercise stage, and exercise behavior was best predicted by intention rather than stage. 2. These results were the first to show that TPB can predict exercise stage over a significant time period.

Table of studies examining the TPB in the physical activity and exercise domain.

Courneya, 1995	To examine whether stage of readiness for regular physical activity is related to beliefs concerning perceived social pressures, attitude, perceived control and intention.	Cross-sectional	288 Adults 60 Years and older Mean Age 71.5 Years (SD = 6.3) 63% Female	Volunteers from the Kirby Center (Calgary, Alberta)	1. *Physical Activity:* Self-report via initial questionnaire and follow-up two weeks later. 2. *Stage of Readiness:* Questionnaire adapted from Marcus et al., (1992) 3. *Behavioral Beliefs:* 7 questions, 7-point likert scale 4. *Control Beliefs:* 7 most important barriers questioned via 7-point likert scale 5. *Subjective Norm:* 1 question, 7-point likert scale 6. *Attitude:* Four items measured by 7-point bipolar adjective scales 7. *PBC:* 3 questions measured by 7-point likert scale 8. *Intention:* Four different scales.	All Ss could be categorized into 1 of 5 stages of change. Significant linear relationships found between each TPB construct and stage of physical activity. Most important discriminators among stages were intention, attitude and PBC. Direct effect of attitude on stage of readiness and control beliefs on attitude and intention.

Table of studies examining the TPB in the physical activity and exercise domain.

Courneya & McAuley, 1995	To examine cognitive constructs from the TPB as potential mediators of the relationship between selected social constructs and adherence to structured exercise classes.	Longitudinal Prospective	62 Adults: 77% Female Mean Age =38.79 (SD = 14.73) 53% Regular exercisers for one month before exercise program.	Volunteers from an aerobics program.	1. *Subjective Norm:* 4 Items on 7-point scales with anchors using strongly disagree (1) and strongly agree (2). 2. *Social Support:* Social Provisions Scale (SPS) (Cutrona & Russell, 1987) 3. *Cohesion:* Group Environment Questionnaire (GEQ) (Widmeyer et al., 1985) 4. *Attitude:* 6 7-point (-3 to +3) bipolar adjective - opposite scales. 5. *Perceived behavioral control:* 3 questions (Ajzen & Madden, 1986) 6. *Intention:* A single continuous-closed scale (Courneya, 1994, Courneya & McAuley, 1993). 7. *Exercise Adherence:* Ss sign in at exercise class of weeks 9-12 8. *Exercise Intensity:* Ratings of Perceived Exertion (Borg, 1985).	Support for the TPB. Support for the social influence constructs. Intention sole determinent of exercise adherence. Intention determined equally by both attitude and PBC. The social influence - exercise adherence relationship is mediated by PBC - intention path. The cohesion - exercise adherence relationship is mediated by the attitude - intention path.

Table of studies examining the TPB in the physical activity and exercise domain.

Theodorakis et al., 1995	To examine attitudes and intentions of physical education students toward teaching individuals with disabilities.	Cross-sectional	99 University Physical Education Students 42 Males 57 Females Age Range = 18-20 Years	Volunteer	1. *Intention:* 3 items, total score on 7-point likert scale 2. *PBC:* 4 items, 7-point likert scale 3. *Attitude:* One question, five bipolar adjectives, 7-point likert scales 4. *Subjective Norms:* Two 7-point likert scales 5. *Role Identity:* Four items; 7-point agree/disagree scales (Theodorakis, 1994) 6. *Attitude-Strength:* Six strength related attitude dimensions (Theodorakis, 1994)	Significant relations were found between intention and attitudes toward behavior, intention and PBC, intention and role identity and intention and attitude strength. Role identity is an important mediator factor between attitudes and behavioral intention. Attitude strength was also a significant determinent of intention for teaching individuals with disabilities.

Table of studies examining the TPB in the physical activity and exercise domain.

Courneya & McAuley, 1994	To explore if different determinents exist for each of the three components of physical activity.	Longitudinal Prospective	170 Ss 81 Men; 89 Women Mean age = 20.34 years (SD = 2.15)	Volunteer	1. *Intention:* 1 question, continuous open measure involving a description of RPE. 2. *Attitude:* 2 scales used: a) A single item, 11 point scale on how important regular physical activity is. b) A summation of responses of the importance of physical activity in comparison to other activities. 3. *Self-Efficacy:* 3 7-item scales: frequency, intensity and duration of physical activity. 4. *Affect::* The Subjective Exercise Experiences Scale (SEES) 5. *Physical Activity:* Measured at 2 and 4 weeks post initial survey. Measured frequency, duration and intensity by self-report.	The determinents of physical activity components appear to differ in kind and in degree. Intention had a higher correlation with duration than intensity or frequency. Self-efficacy contributed to frequency and intensity but not to duration. Self-efficacy is the most important determinent of intended physical activity for each of the three components. Attitude was a significant contributor to frequency and duration. Positive affect contributed only to intended intensity.

Table of studies examining the TPB in the physical activity and exercise domain.

Godin et al., 1994	To describe the salient perceived barriers to exercise in three different groups and to examine the perceived barriers characterizing individuals with a high or low intention to exercise in accordance with the TPB.	Qualitative. Cross-sectional Questionnaire.	3 Different Groups: *Group 1:* General Population (GP) 349 middle aged adults 130 Males 219 Females Mean Age = 38.1 years *Group 2:* Coronary Heart Disease (CHD) 162 Ss 137 Males 25 Females Mean Age = 56.6 years *Group 3:* Pregnant Women (P) 152 Females Mean Age = 27.3 years Between 4 and 5 months pregnant.	GP: Random sampling of telephone numbers. Volunteer CHD: Volunteer P: Volunteer	1. *TPB Constructs:* a) Perceived Barriers as measured on a 7 point scale. b) Behavioral Intention by answering single question.	1. Ss in each group had fairly high intention to exercise. 2. Different groups had different perceived barriers to exercise: a) GP: Finding Time b) CHD: No access to specialized exercise center, physician's contra-indication, heart pain c) P: Baby's physical health problems, finding time. 3. Differences in barriers between high and low intenders a) In GP sample, compared to high intenders, low intenders lack of access to sporting facilities, time, cost and difficulty getting exercise partner. b) In CHD sample, high from low differentiated by 5 barriers: time, age, psychological difficulties, fear of reinfarction and laziness.

Table of studies examining the TPB in the physical activity and exercise domain.

Theodorakis, 1994	To examine the attitude-exercise behavior relationship according to the TPB.	Cross-sectional	395 Females Age = 18 to 45 years Mean Age = 29.27 (SD = 8.75)	Random stratified sampling from 50 exercise classes in 4 fitness clubs. Ss participated for at least 1 month, familiar with the program, experienced and participate 3X per week.	1. *Intention:* Total score on 3 items rated on a 5-point scale from likely to unlikely. 2. *Attitude:* One question rated on eight bipolar adjectives using a 5-point scale. 3. *Subjective Norms:* Assessed by a single question which was multiplied by response to a 5-point scale on motivation to comply. 4. *PBC:* Nine items scored on a 5-point scale. 5. *Role Identity:* 7 items scored on a 5-point scale 6. *Attitude Strength:* 6 strength related attitude dimensions (Bagozzi & Yi, 1989; Budd & Spencer, 1984; Davidson et al., 1985; Felson & Bohrnstedt, 1980; Marks & Miller, 1985) 7. *Exercise Behavior:* Attendance recorded by staff, self-reported absences and outside of facility exercise participation.	Support the predictive ability of the TPB excluding the SN variable. PBC was a stronger predictor than intention. The TPB model was more successful in predicting exercise adherence and participation when attitude strength and role identity were included.

Table of studies examining the TPB in the physical activity and exercise domain.

Wankel et al., 1994	To investigate the utility of various social-psychological variables for predicting intentions to engage in physical activity within a national population.	Longitudinal, correlational follow-up investigation of a cross-section of the Canadian population (1981 Canada Fitness Survey).	3,679 Individuals 1,733 Males 1,946 Females	Volunteer	1. *Physical Activity:* Self-reported physical activity 2. *Intention:* How often Ss intended to exercise in the 12 months following the survey. 3. *Attitude:* Six evaluative semantic differential scales and one 5-point bipolar adjective scale. 4. *Perceived Social Support/ Subjective Norm:* 7 5-point Likert-type questions.	Both the direct and indirect measure of attitude were significant contributors to prediction of intention. PBC increased the predictive ability of the model. Behavioral intentions of males and females were not significantly different. Successive decrease across age in intention to be active; intention strongest in youngest age group.
Godin, Valois & Lepage, 1993 Study 1	To verify the basic assumptions of the TPB for the prediction of exercise intentions and behavior among adults of the general population.	Cross-sectional	347 Ss 130 Males 217 Females	Random telephone numbers. Volunteer.	1. *Behavior:* Self-reported exercise during past 6 months. 2. *TPB Constructs:* a) Behavioral Intention: Two measures. b) Attitude: direct and indirect assessed c) Subjective Norm: direct and indirect assessed d) Perceived Behavioral Control: Two measures e) Habit: Two measures f) Personal Variables	1. Intention, PBC and habit directly influenced behavior. 2. PBC and habit influenced behavior indirectly through intention. 3. Social Norm did not predict intention.
Godin, Valois & Lepage, 1993 Study 2	To verify the basic assumptions of the TPB for the prediction of exercise intentions and behavior among pregnant women.	Cross-sectional	136 Females Between 18 and 40 years Between 4 and 5 months pregnant	Volunteer.	1. *Behavior:* Self-reported exercise since childbirth. 2. *TPB Constructs:* Same as Study 1.	1. Habit and PBC (NOT intention) influenced behavior directly. 2. Attitude, PBC, habit influenced behavior indirectly through intention. 3. Social Norm did not predict intention.

Table of studies examining the TPB in the physical activity and exercise domain.

Rodgers & Brawley, 1993	To provide a preliminary illustration of how the Self-Efficacy Theory (SET) and the TPB can be used together to provide more information than either theory alone.	Cross-sectional	27 Participants	Volunteers from a self-help group in a community hospital agreed to participate in the exercise related addition to the existing weight loss program of 10 weeks.	1. *Social Persuasion:* Videotape (16 min) designed to change attitudes and PBC toward physical activity by affecting SET and TPB variables. In addition, 30 min of exercise related intervention (discussion of video) occurred weekly. 2. *Self-Efficacy/PBC::* Measured five times, 100% confidence scales. 3. *Attitudes:* Measured five times; five semantic differential items rated across a 7-point range. 4. *Outcome Expectancy:* Calculated from product of outcome likelihood and outcome value. 5. *Behavioral Intention:* Two signal 7-point Likert scale items (healthy eating habits and participation in exercise)	PBC significant predictor of adherers intention at weeks 7 and 9. Outcome expectancy predicted intention early in the program, Self-efficacy (SE) predicted intention late in the program. Significant differences between adherers and drop-outs on SE and Intention for exercise (Drop-outs greater decreases). Both models used together provided a clearer portrayal of adherers and drop-outs than either theory alone.

Table of studies examining the TPB in the physical activity and exercise domain.

Yordy & Lent, 1993	To explore the utility of reasoned action, planned behavior and social cognitive models in explaining aerobic exercise intentions and behavior.	Cross-sectional	234 Students 191 Females 93 Males Mean Age = 19.4 Years (SD = 2.29)	Volunteer	1. *Theory of Reasoned Action:* a) Attitude: Three items measured on a 7-point bipolar scale b) Subjective Norm: Three items measured on a 7-point bipolar scale. 2. *TPB:* a) PBC: Three items rated on a 7-point bipolar scale 3. *Social Cognitive Theory:* Self-efficacy for exercise questionnaire (Dzewaltowski, 1989) 4. *Exercise Intentions and Behavior:* a) Prior Exercise - self-reported exercise for past 4 weeks b) Future Exercise Behavior - Three items rated on a 7-point scale.	The combined TRA and TPB model serve as a good predictor of exercise intentions. The PBC and the interaction variables do not improve the predictive efficiency of the model. Intentions, self-efficacy, and outcome expectancies contributed to discriminating those who exercised and those who don't.

Table of studies examining the TPB in the physical activity and exercise domain.

Kimiecik, 1992	To compare the utility of the theories of reasoned action and planned behavior in predicting exercise intentions and behavior of corporate employees.	Cross-sectional	332 Corporate employees of a Fortune 500 company. Age Range = 18-67 Average Age = 39.1 176 Males 154 Females	Volunteer	1. *Reasoned Action/Planned Behavior Constructs:* a)Beliefs: Products of 6 behavioral beliefs were summed. b)Subjective Norm: Products of the strength each normative belief and motivation to comply for 3 beliefs; summed. c)PBC: Sum of 7 control beliefs for each barrier. d) Intention: Single question measured on 7-point semantic differential scale e) Attitude: Single question measured on a 7-point scale f) Exercise Behavior: Self-reported exercise behavior for the past month	Results support the TPB with PBC making a significant increase in the predictive ability of the model.
Madden, Ellen & Ajzen 1992	To test the TPB empirically and to extend the work of Ajzen and Madden (1986) by assessing behaviors that vary in degree of perceived control.	Cross-sectional	94 Undergraduate business students	Not Stated	1. *TPB Constructs:* a) Attitudes: 10 behaviors, 5 item semantic scale b) Subjective Norms: One 7 point item; Motivation to comply: one 7 point item c) PBC: 4 items (Ajzen & Madden, 1986) d) Intentions: Three 7 point items. 2. *Behaviors:* Self-report number of times performed during preceding two weeks.	1. Exercise was ranked as the behavior in which Ss had third lowest control over. 2. PBC did aid in the prediction of intentions and target behavior. 3. The prediction of target behavior was related to the magnitude of PBC.

Table of studies examining the TPB in the physical activity and exercise domain.

Theodorakis, 1992	To use the TPB to predict training frequency from young swimmers' intention to participate in team training sessions.	Cross-sectional	98 Children 52 Boys 46 Girls 10 to 13 Years Mean Age = 11.1	Random stratified sampling from 6 swim clubs.	1. *Questionnaire:* a)Behavioral Intention: 3 items b) Outcome evaluation: 10 salient consequences of participating in all sessions. Belief Strength as measured on all 10 consequences c)Subjective Norm: Indirect and direct d)PBC: Two measures 2. *Behavior:* Past Behavior Attendance in hours as assessed by parents.	1. Supported TPB model 2. Subjective Norm contributed more strongly to intention than attitude. 3. PBC increased predictive effect of model.

Table of studies examining the TPB in the physical activity and exercise domain.

Godin et al., 1991	To understand the intention to exercise of individuals who suffer from CHD.	Cross-sectional Questionnaire	161 Ss who had suffered an uncomplicated myocardial infarction. 24 Female 137 Men Mean Age 52.8 years	Volunteer.	1. *Behavioral Intention*: 1 item 2. *Attitude*: 8 semantic differential scales 3. *Subjective Social Norm:* 1 item 4. *PBC*: 2 items 5. *Indirect measure of Attitude:* 11 items 6. *Indirect measure of subjective social norm*: 4 items 7. *Habit*: 1 item, Self-report physical activity 8. *Personal Normative Belief:* 1 item 9. *Perceived Severity*: 1 item 10. *Perceived Vulnerability*: 1 item	1. Habit, perceived difficulty and perceived barriers are, of decreasing importance, the most important predictors of intention to exercise. 2. Attitude was not a predictor of intention. 3. CHD Ss barriers appear to be psychological. 1. Time management 2. Psychological adaptedness 3. Laziness 4. Perceived vulnerability and perceived severity of a re-infarction did not affect intention to exercise.

Table of studies examining the TPB in the physical activity and exercise domain.

Dzewaltowski , Noble & Shaw, 1990	To compare the TRA, TPB and social-cognitive theory in the prediction of physical activity participation.	Cross-sectional	254 Undergraduates 121 Males 133 Females	Not Stated	1. *Physical Activity Participation:* Self-report via 7 day recall instrument administered for five weeks. 2. *TRA and TPB:* a) Intention: 4 items b) Attitude: 2 items c) Subjective Norm: 1 item d) PBC: 3 items 3. *Social Cognitive Theory:* a) Strength of Ss Self-efficacy Towards Physical Activity: 2 items b)Outcome expectations: free response format c) Self-evaluation: 2 formats	1. Attitude but not subjective norm was strong predictor of physical activity. 2. PBC did not have a direct effect on behavior. 3. Efficacy had a direct effect on behavior, therefore not the same as PBC. 4. Self-efficacy best predictor of physical activity behavior.
Gatch & Kendzierski, 1990	To examine the utility of the TPB for predicting exercise intentions.	Cross-sectional	100 Female University students. Age Range = 18-26	Volunteer members of aerobic classes who were paid minimally for their participation.	1. *Attitudes:* Response to one question measured by the sum of 8 7-point semantic differential scales. 2. *Subjective Norm:* Product of reply to two questions. 3. *PBC:* Summed responses to five questions measured on a 7-point scale. 4. *Intentions:* Summed responses to five questions as measured on 7-point scales.	Replicated previous findings. Demonstrated that a linear combination of attitude and subjective norm predicts intention to exercise and that attitude predicts intention more than subjective norm. The addition of PBC increased the predictability of exercise intentions.

Table of studies examining the TPB in the physical activity and exercise domain.

Godin, Vezina & Leclerc, 1989	To identify factors that may influence a pregnant woman's decision to exercise after giving birth.	Cross-sectional. Questionnaire.	98 Pregnant Women Mean Age = 28.6 Years Attending prenatal education classes in Quebec.	Volunteer	1. *Behavioral Intention*: 1 item 2. *Attitude Towards The Act:* 6 semantic differential scales 3. *Subjective Social Norm:* 1 item 4. *Role Belief:* 1 item 5. *Perceived Barrier:* 1 item 6. *Habit:* Self-report Physical Activity 7. *Demographic Variables*	1. Barriers to exercise were perceived as easy to overcome for pregnant women who had the habit of exercising before they became pregnant and as hard to overcome for women who were having their second child. 2. Intention was strongly correlated to attitude, exercise habit and perceived barriers. 3. Role belief was associated with the number of months since the onset of pregnancy. 4. Variation in parity exerts an influence on behavioral intentions.

Table of studies examining the TPB in the physical activity and exercise domain.

Valois, Deshamais & Godin, 1988	To compare the efficiency of the TPB and the Triandis models to predict the intention to participate in physical activity and the specific exercise behaviors.	Cross-sectional.	166 Laval University employees 100 Males 66 Females Mean Age = 39.7 years All Caucasian Ss.	Random selection Volunteer.	1. *Beliefs:* 13 beliefs concerning consequences of physical activity measured on 7 point semantic differential scale. 2. *Values*: 13 values 3. *Attitude*: 6 semantic differential scales 4. *Subjective Norm:* One item 5. *Affect:* 6 items 6. *Social Norm and Role*: 2 items 7. *Personal Normative Belief*: 1 item 8. *Facilitating Conditions*: 1 item 9. *Habit*: 2 items 10. *Intention*: 1 item 11. *Behavior*: Self-reported physical activity for three weeks.	1. Triandis model as effective as TPB in predicting exercise behavior. 2. Triandis model superior to TPB model in explaining behavioral intention.

Table of studies examining the TPB in the physical activity and exercise domain.

Godin, Shephard & Colantonio, 1986	To identify the cognitive profile of people who intend to exercise but fail to carry out this intention using the Fishbein-Ajzen theoretical framework of behavioral intentions.	Cross-sectional. Questionnaire.	163 Ss from a current list of University of Toronto employees. Mean Age = 39 Years	Stratified Random Sampling. Volunteer.	1. *Beliefs and Values:* 14 items evaluated on a 7 point scale. 2. *Normative Beliefs and Motivation to Comply:* 5 items each. 3. *Intention:* 1 item on a 7 point likely/unlikely scale. 4. *Behavior:* Self-report of physical activity over previous two months.	1. Little difference between the cognitive profiles of inactive and active positive intenders. 2. Ss with more positive intentions identified more advantages to being physically active. 3. Ss with positive intentions to exercise but had inactive behaviors perceived exercise to be time consuming and tiring. 4. Lack of time should not be viewed in this study to be equated with lack of interest or commitment since the Ss who were positive intenders but inactive had expressed interest and commitment in a strongly positive intention to exercise.

Table of studies examining the TPB in the physical activity and exercise domain.

APPENDIX B

Reference	Purpose	Study Design	Sample Size & Composition	Sample Selection	Instruments/Measures	Main Conclusions
Macan, 1996	To examine the effects of a time-management training program on employees' self-reports of time management behavior, control over their time, job satisfaction, stress responses and job performance.	Quasi-experimental field study	38 employees received time management training 39 employees in control. 80% Female Mean Age = 36 Years	Volunteer	1. *Time Management*: Time Management Behavior Scale (TMB) (Macan, 1994; 1990). 33 items, measuring goal setting/ prioritizing, mechanics of time management, preference for organization. 2. *Perceived Control Over Time:* 5 items (Macan, 1994; 1990). 3. *Job-induced tension scale*: 6 items (House & Rizzo, 1972) 4. *Somatic tension scale*: 5 items (House & Rizzo, 1972) 5. *Job satisfaction scale* :3 items (Hackman & Oldham, 1975)	1. Participants did not report engaging more frequently in time management behaviors after participating in the time management training program. 2. Participants who did receive time management training did perceive more control over their time. 3. Participants who received time management training did not differ in job performance. 4. No significant differences were found between training and no training groups for job satisfaction and job induced tensions.
Williams, Verble, Price & Layne; 1995	To determine the relationship between time management practices and personality types and indices in a group of college students.	Experimental	204 Undergraduate and graduate students 48 Males 156 Females Age Range = 18-52 Average Age = 21.9	Volunteer	1. *Time Management:* Time Management Questionnaire (TMQ) (Britton & Tesser, 1991) 2. *Personality Type:* Form G of the MBTI 3. *Social Desirability:* Marlowe-Crowne short form	1. All of the Time Management indices were significantly related to the J-P Index of the MBTI. 2. The TMQ Long Range Planning was significantly related to the S-N Index. 3. T-F Index was not related to any of the time management factors. 4. Good time managers seem to have a preference for planning, organization and sensory based information.

Table of Studies Examining Time Management And The Effectiveness of Time Management Training.

Hessing; 1994	To examine the concept of women's time management in their combined workloads of household and workplace. To investigate women's strategies for carrying out the combined demands of their paid and household labor.	Qualitative Interviews	51 Female staff members of a mid-sized post-secondary institution. Age Range = 20 - 64 Years 53% Sample (27 Ss) parents of children who live at home. 4 of 27 Ss single parents.	Volunteer.	1. *Interview:* 2 to 4 hours in length: Questions regarding: a) Work biographies b) household composition & responsibilities c) Nature of workdays d) Perspectives of job e) Attitudes towards women's paid & domestic employment f) Current and past employment 2. *Self-Reported Workday:* Chronological Order of household activities and workplace activities	1. Women adapt their use of time to office schedules and household activities. 2. Actively involved in manipulating the sequence and duration of activities: a) Prioritization of office schedule b) Routinization of activities c) Synchronization of events d) Extending and condensing the workday e) Preparation for contingency f) Scheduling the household 3. Combined workloads make time management vital and necessary. 4. Time is organized as a resource.

Table of Studies Examining Time Management And The Effectiveness of Time Management Training.

Macan, 1994 Study 1	To examine the structure of the Time Management Behavior Scale (TMB) in an employed sample and then to assess the linkages among time management training, time management behaviors, perceived control over time and the behavioral outcomes of time management.	Cross-sectional	353 (usable surveys) Employees at a public service agency and a correctional facility. 56% Female Mean Age = 37 Years - 45% of Ss had participated previously in Time management Seminars. -More than half of the Ss had read Time Management books	Volunteer	1. *Time Management Training:* a) Previous training b) Half day of training involving : i)goal setting ii) prioritizing iii) making lists iv)scheduling and planning v) organization vi) procrastination vii) interruptions. 2. *Time Management Behaviors(TMB):* 33 behaviors scored on a 5-point Likert type scale. 3. *Perceived Control Over Time:* 5 items scored on a 5-point Likert type scale. 4. *Job Induced and Somatic Tensions:* a) 6 item Job-Induced Tension Scale b) 5 item Somatic Tension Scale 5. *Job Satisfaction:* 3 item General Job Satisfaction scale 6. *Job Performance ratings* 7. *Person and Situational Variables:*	1. 3 factors accounted for 81% of the variance: a) Goal Setting & Prioritizing b) Mechanics of Time Management (scheduling & planning) c) Preference for Organization. 2. Good support was found for the hypothesized Time Management model. 3. Time management training was not found to be very effective in increasing the adoption of certain time management behaviors. 4. Ss who set goals and priorities and had a preference for organization perceived themselves to have greater control over their time than those who did not set goals but had a preference for organization. 5. A perception of control over time was related to job satisfaction and reduced stress tensions.

Table of Studies Examining Time Management And The Effectiveness of Time Management Training.

Macan, 1994 Study 2	To compare Ss self-reported time management behaviors with a multitrait-multirater approach in order to increase the construct validity of the time management measures.	Cross-sectional	341 University students (*N*=260 undergraduate, *N*=81 graduate students in psychology and business courses) Age Range = 19 - 57 Mean Age = 25 53 % Female	Volunteer	1. *Same Time Management Questionnaire used in Study 1* 2. *Revised Version of the Time Management Questionnaire for Ss coworkers, relatives, friends.*	1. The best convergence was found between self-ratings and coworkers.
Yoels & Clair; 1994	To research time and its management, how residents learn to manage their time and how residents experience time contingencies.	Qualitative: Field Observations and Interviews.	150 Housestaff: 50 Postgraduate Year 1s (PGY1s) 50 PGY2s 50 PGY3s 76 % Male residents 89% White 84% of Physicians between 26 and 30.	Volunteer.	1. *Field Observations:* Observed new patients (under the condition of observer as participant) by following the patients for approximately 2 hours and by following physicians for 2 hours between appointments. Total observations = 173 involving 88 different residents. 2. *In-depth Interviews:* Random selection of 25% of residents for interview.	1. Residents learned that it was necessary to spend less time with patients; to work more quickly. 2. Selective attentiveness. 3. Deflecting time complaints onto nurses. 4. Using other residents for time shortcuts. 5. manipulating (Controlling) the time schedule.

Table of Studies Examining Time Management And The Effectiveness of Time Management Training.

Orpen, 1993	To test for the effectiveness of time management training.	Field experiment Random assignment of Ss to experimental and control groups.	52 Supervisors working for a medium sized Australian manufacturing company.	Part of company training program	1. *Time Management Program:* 3 Days - Lectures, discussions, exercises and role plays. Based upon Lakein (1991) and Mackenzie (1978) Covered: a) goal setting b) prioritizing c) interruptions d) time planning e) time diaries f) incoming information 2. *Self-report Measure of Time Management Effectiveness-Attitudinal:* Immediately after completing the program and 4 weeks after the program. 3. *Self-report Measure of Time Management Effectiveness - Behavioral:* Activity Diary	1. The experimental Ss rated their time management effectiveness significantly more highly than control. 2. Among the experimental group, the Ss who felt that the program had reached its' objectives rated their own time management effectiveness higher. 3. Correlations between time management effectiveness measure and the extent to which the Ss felt that they benefited were significant for both the self-report measure and behavioral measure. 4. Time management training seemed to indicate an improvement in time management behavior.

Table of Studies Examining Time Management And The Effectiveness of Time Management Training.

Winter, Puspitawati, Heck & Stafford; 1993	To analyze two time management strategies (reallocation of personal time and obtaining additional help) used to respond to the demands of home based work.	Qualitative Survey: Interviews	899 Households Interviewed which had home based employment. - Interviews conducted with "household manager". - 482 cases, respondent also home based worker. - 417 cases, respondent home based worker's partner or spouse.	Volunteer.	1. *Characteristics of the Respondent:* a) Age b) Education c) Marital Status d) Gender e) Employment Status 2. *Characteristics of the Household:* a) Household Income b) Household Size c) Rural - Urban Location d) Pressure from the home based work 3. *Time Management Interview:* a) Question regarding reallocation of personal time b) Question regarding use of additional help	1. Personal Time is more often reallocated than obtaining additional help for either home based work or household production. 2. Different time management strategies are used depending on whether the household manager is also the home based worker. - Respondents holding both roles report reallocating personal time more often than respondents who are not home based workers; reverse is true for obtaining additional help. 3. Households generating higher income, where home based work is a full time occupation are more likely to use time management strategies.

Table of Studies Examining Time Management And The Effectiveness of Time Management Training.

Simons & Galotti, 1992 Study 1	To assess planning, prioritization, and completion of daily activities in a college age sample.	Experimental	88 undergraduate students. 46 Freshman (20 Male and 26 Female) 42 Seniors (21 Male and 21 Female)	Voluntary, uncompensated participation	1. *Definition of "Planning" Essay.* 2. *Galotti-Simons Planning Survey (GSPS):* Planning practices questionnaire. 3. *Goal-Setting Task:* Ss listed all goals for next day in order. 4. *Goal prioritization task:* Assigned each goal a priority value. 5. *Accomplishment Scheduling:* Self-report of goal accomplishments 6. *Follow-up Questionnaire*	1. Seniors scores on the GSPS higher than Freshman. 2. Female scores on the GSPS higher than males. 3. Ss with higher GSPS scores were less likely to describe planning in terms of "stress reduction", "predetermined decisions" and "anticipating the future". 4. Male GSPS scores highly correlated with "achieving satisfaction" and female scores marginally correlated with "organizing". 5. Poor planners separated high priority goals from medium and low priority goals. Good planners separated high priority goals from low priority but did not distinguish high priority goals from medium priority.
Simons & Galotti, 1992 Study 2	To replicate study 1 findings by using a more precise operationalization of goal completion.	Experimental	48 Undergraduate Ss 13 Male 26 Female	Volunteer.	*Same measures and instruments as in Study 1 with the exception of item 5.* 5. *Goal Completion: Ss* were given a typed list of their prioritized goals and were asked to check off each goal that they had completed.	1. Study 2 findings replicated study 1. 2. No major behavioral differences were found between good and poor planners, however, this study occurred over one day, the differences between the groups may be accentuated for longer range planning.

Table of Studies Examining Time Management And The Effectiveness of Time Management Training.

Valois, Desharnais & Godin, 1988	To compare the efficiency of the TPB and the Triandis models to predict the intention to participate in physical activity and the specific exercise behaviors.	Cross-sectional.	166 Laval University employees 100 Males 66 Females Mean Age = 39.7 years All Caucasian Ss.	Random selection Volunteer.	1. *Beliefs:* 13 beliefs concerning consequences of physical activity measured on 7 point semantic differential scale. 2. *Values*: 13 values. 3. *Attitude*: 6 semantic differential scales 4. *Subjective Norm:* One item 5. *Affect:* 6 items 6. *Social Norm and Role*: 2 items 7. *Personal Normative Belief*: 1 item 8. *Facilitating Conditions*: 1 item 9. *Habit*: 2 items 10. *Intention*: 1 item 11. *Behavior*: Self-reported physical activity for three weeks.	1. Triandis model as effective as TPB in predicting exercise behavior. 2. Triandis model superior to TPB model in explaining behavioral intention.

Table of studies examining the TPB in the physical activity and exercise domain.

Godin, Shephard & Colantonio, 1986	To identify the cognitive profile of people who intend to exercise but fail to carry out this intention using the Fishbein-Ajzen theoretical framework of behavioral intentions.	Cross-sectional. Questionnaire.	163 Ss from a current list of University of Toronto employees. Mean Age = 39 Years	Stratified Random Sampling. Volunteer.	1. *Beliefs and Values:* 14 items evaluated on a 7 point scale. 2. *Normative Beliefs and Motivation to Comply:* 5 items each. 3. *Intention:* 1 item on a 7 point likely/unlikely scale. 4. *Behavior:* Self-report of physical activity over previous two months.	1. Little difference between the cognitive profiles of inactive and active positive intenders. 2. Ss with more positive intentions identified more advantages to being physically active. 3. Ss with positive intentions to exercise but had inactive behaviors perceived exercise to be time consuming and tiring. 4. Lack of time should not be viewed in this study to be equated with lack of interest or commitment since the Ss who were positive intenders but inactive had expressed interest and commitment in a strongly positive intention to exercise.

Table of studies examining the TPB in the physical activity and exercise domain.

APPENDIX C

Gallucci, 1995.	To determine if participants set their own goals for exercise, if goals were stable over time, if the goals influenced maintenance behavior.	Experimental.	34 Males 96 Females Employees involved in exercise programs. Mean age of 34.12 years.	Volunteer	1. *Pre-experimental Questionnaire:* Questionnaire completed at start of program. 5 questions involving goals for classes, reasons for exercise, degree to which goals influenced exercise, estimates about amount of time required to reach goal, likelihood goals would be accomplished in the time period and % goal already accomplished. 2. *Post-experimental Questionnaire:* Identical questionnaire completed after two months.	93% participants had goals. Goals stable across time. Participants who rated goals as more influential and likely to be achieved had higher rates of attendance.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Lerner & Locke, 1995.	To measure the effects of goal setting, competition and personality on performance of a 1 minute endurance task.	Experimental. 5 groups: competitive medium goal, competitive high goal, medium goal, high goal, do best group.	75 undergraduate males. Mean age of 20.4 years.	Stratified random assignment of volunteers from physical education class.	1. *Experimental task:* 1 minute sit-up endurance task (Hall & Byrne, 1988). 2. *Competition Questionnaire:* a) Sport Orientation Questionnaire (Gill & Deeter, 1988). b) 3 competitiveness factors measured on a 5 point likert scale 3. *Goal Commitment:* Measured using 6 items of the 7 item scale (Hollenbeck, Williams & Klein, 1989). 4. *Personal Goals:* Measured prior to task. 5. *Self-efficacy:* Ss rated their estimate of his/her capability of completing sit-ups. 6. *Self-efficacy strength:* Measured by how much confidence Ss had in being able to do the sit-ups; rated on a scale of 1-10.	Specific goals led to better performance than do best. Self-efficacy related to personal goal level, goal commitment and performance.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Bar-Eli, Hartman & Levy-Kolker, 1994.	To test goal setting and goal proximity as a motivating technique for enhancing physical activity.	Experimental.	42 Males 38 Females Israeli adolescents with behavior disorders 15 years old	Voluntary Random assignment to long-term or to long and short-term goals.	1. *Experimental task:* 10 week program, 1 minute sit-up task. 2. *Questionnaire:* Completed prior to task and involved Ss answering perceived difficulty and intended effort questions. Post task, Ss asked how hard they had tried.	Long and short-term goals better than long-term alone. Increased effectiveness of goals over time.
Bar-Eli et al.., 1993.	To examine the effect of goal difficulty on performance of anaerobic, aerobic and power tasks in both the lab and field settings.	Experimental.	104 Males 80 Females Ss participating in a 2 month army training camp. Age range 18-21.	Volunteer. Random assignment to one of six goal setting conditions.	1. *Physical tasks:* Males tested on 7 physical tasks; females on 6. 2. *Questionnaire:* Perceived difficulty to achieve the goal and extent of intended effort.	No significant differences between goal setting groups on any physical tasks.
Anshel et al., 1992.	To ascertain if intrinsic motivation could be undermined if subjects were required to meet a difficult goal, especially when performing a complex motor task.	Experimental. Subjects assigned to 4 different goal setting conditions.	54 subjects	Volunteer	1. *Experimental task:* 3 Phases of juggling. Novel juggling task involving two sets of 20 trials with 2 bags and another set of 20 trials with 3 bags. No knowledge of results given, positive feedback qualitative feedback given during performance. 2. *Questionnaire:* Mayo Task Reaction Questionnaire completed for both tasks; after first 20th trial and again after second 20th trial.	Setting difficult goals increased intrinsic motivation and did not impede performance. Setting easy goals decreased intrinsic motivation and performance.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Poag & McAuley, 1992.	To measure the relationships between goals, efficacy, and the frequency and intensity of exercise behavior.	Experimental.	76 Adult females enrolled in one of three conditioning classes. Mean age of 52 years.	Volunteer.	1. *Program Assessment:* Ss completed an initial inventory assessing basic info, exercise history, exercise participation goals and perceived barriers. 2. *Exercise Goals & Efficacy:* Ss rated 5 goals on a 7 point likert scale. 3. *Exercise Importance and Efficacy:* Ss rated the importance of exercise frequency, duration and intensity to the realization of their exercise goals on a 7 point likert scale. 4. *Post-program Assessment:* Ss rated selves on goal achievement on a 7 point likert scale. Exercise behavior was measured by perceived exertion self-report and by frequency as assessed by attendance at classes.	Goal efficacy was positively related to perceived goal attainment.
Smith & Lee, 1992.	To measure the practice time, publication of goal setting and use of strategies in relation to goal setting and performance of a novel task.	Experimental.	51 university students. Mean age of 22.5 years.	Volunteer, random assignment to public goal setting, private goal setting, or no goal setting conditions.	1. *Experimental task:* Novel coordination task using a basketball. Ss participated individually. 2. *Post task Questionnaire:* Ss asked if they had selected a goal and what it was in addition to being asked if they had used any strategy in completing the task.	6 subjects from the control group stated that they had set goals. Subjects in both goal setting groups performed better than those in do best, and were more likely to employ specific strategies.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Tenenbaum et al.., 1991.	To measure the relationship between goal specificity, goal proximity and performance while attempting to control for social comparison.	Experimental.	96 male, 118 female Israeli ninth grade students.	Volunteer, random assignment to one of five goal setting conditions.	1. *Questionnaire:* Ss asked to rate perceived difficulty of their goals and how hard they intended to try to reach their goals before task. After task Ss again asked how hard they tried. 2. *Experimental task:* 3 minute sit-up task. 10 week training program.	Subjects in the combined short and long term goals condition exhibited the greatest improvement in performance.
Weinberg et al., 1991. Experiment 1	To determine if setting unrealistic goals would produce any significant decreases in motivation and performance.	Experimental.	114 Males 135 Females Ss in elementary school.	Volunteer, random assignment to one of four goal setting conditions.	1. *Experimental task:* 2 Minute sit-up task (Weinberg, et al., 1988). 5 weeks of prior practice. 2. *Questionnaire:* 3 Items, administered after goals assigned at beginning of experimental period.	No significant differences between groups.
Weinberg et al., 1991. Experiment 2	To determine if setting unrealistic goals would produce any significant decreases in motivation and performance.	Experimental.	50 Male 50 Female Ss university students. Recreation basketball players.	Volunteer Randomly assigned to one of five goal setting conditions.	1. *Basketball shooting task:* 3 Minutes. 2. *Questionnaire:* 5 Items; All conditions except do your best completed questionnaire.	No significant differences between groups. 88% of do best subjects set own goals.
Weinberg, Bruya & Jackson, 1990.	To determine the effects of specific goals on performance and to see if competition or social comparison confounds results.	Experimental.	41 Males 35 Females Ss enrolled in one of three fitness courses at university.	Each class was randomly assigned to one of three goal setting conditions.	1. *Experimental task:* 3 minute sit-up task. 3 goal setting conditions of moderately hard, very hard and do best. 2. *Questionnaire:* Similar to Hall & Byrne (1988)	No difference between goal setting groups. Competition and social comparison still active among subjects.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Weinberg et al., 1990. Experiment 1	To measure the effects of goal difficulty and positive reinforcement on endurance performance - sit-up task.	Experimental. Assignment to one of six groups.	87 undergraduate students enrolled in fitness course.	Volunteer Random assignment to groups.	1. *Experimental task:* 3 minute endurance sit-up task. 5 week training program. 2. *Questionnaire:* a) Pre-test: 3 items administered after the goals were assigned, prior to training program. b) Post test, Ss were asked if they had set specific goals and what they were.	No significant difference between goal setting conditions, control and do best groups. 52% of subjects in goal setting conditions and 63% in control set additional goals.
Weinberg et al., 1990. Experiment 2	To measure the effects of goal difficulty and positive reinforcement on endurance performance - grip strength.	Experimental. Assignment to one of four groups.	120 subjects.	Volunteer Random assignment to one of four goal setting conditions: Moderately difficult goal, difficult goal, unrealistic goal and do best.	1. *Maximum grip strength:* Measured using a Lafayette 4205 hand dynamometer. 2. *Questionnaire:* a) Pre test: questionnaire assessing goal acceptance, goal difficulty and intended effort. b) Post test: Similar to experiment 1.	No significant differences 14 % of subjects in specific goal condition and 24% of do best subjects set own goal. Positive reinforcement did not show a greater improvement in performance.
Weinberg et al., 1988.	To test the effects of goal proximity and goal specificity on endurance performance of young children.	Experimental. 4 goal setting conditions of long term goals, short term goals, long term and short term goals and do best. 10 week study.	130 Males 125 Females Grade 4, 5, 6 children.	Volunteer Random assignment to one of four goal conditions.	1. *Experimental task:* 2 minute sit-up task. 2. *Questionnaire:* 2 item questionnaire given to Ss at each of 5 testing sessions involving goal commitment and intended effort.	All specific goal groups performed significantly better than do best during the last few weeks of the experiment.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Hall, Weinberg & Jackson, 1987.	To examine the relationship between goal difficulty, goal specificity and endurance performance in physical activity and to determine the relationship between different types of information feedback, goals and performance.	Experimental. Received either concurrent or terminal feedback on performance.	94 male university students.	Volunteer, random assignment to one of three goal conditions.	1. *Experimental task:* Grip strength using a Lafayette 4205 hand dynamometer: Three trials, concurrent feedback was a timer, terminal feedback was length of time Ss held contraction. 2. *Post Experimental Questionnaire*	Subjects with specific hard goals outperformed individuals with do best goals. Preference for concurrent feedback.
Weinberg et al., 1987. Experiment 1	To determine if unrealistically high goals will produce performance decrements in the physical education setting.	Experimental.	16 Males 14 Females Ss university students enrolled in fitness courses.	Volunteers Random assignment to one of three goal setting conditions.	1. *Experimental task:* 3 minute sit-up task with 5 weeks of sit-up practice. 2. *Questionnaire:* 3 item questionnaire assigned at beginning of experimental period and involved goal acceptance, goal difficulty, intended effort. Ss also asked to state specific goal each week.	No significant differences between groups. Small positive relationship found between assigned goal difficulty and performance.
Weinberg et al., 1987. Experiment 2	To determine if unrealistically high goals will produce performance decrements in the physical education setting.	Experimental.	40 Males 83 Females Ss university students enrolled in fitness courses.	Volunteers Random assignment to one of three goal setting conditions.	Same instruments and measures used as in Experiment 1.	No significant differences between groups. Small positive relationship found between assigned goal difficulty and performance.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Erbaugh & Barnett, 1986.	To examine the effects of modeling and goal setting on children learning novel physical coordination task. 6 trials of learning, 3 trials of retention.	Experimental. 4 Groups: Modeling, Goal Setting, Modeling & Goal Setting and Control Jump	33 male, 19 female primary grade children. Mean age of 6.1 years.	Volunteer.	1. *Experimental task:* Jumping a horizontally rotating bar (Erbaugh, 1985). 2. *Children's response speed:* Measured using Item 6 of the Bruininks-Oseretski test (Bruininks, 1978).	Goal setting and modeling and goal setting significantly increased children's learning of task. Goal setting more influential.
Perkins et al., 1986	To measure the effect of goal setting, feedback and contingent reinforcement on increased stationary bike riding in nursing home residents.	Experimental.	8 male residents of intermediate/long-term care facility. 46-78 years old. Medical and psychiatric disorders.	Volunteer.	1. *Behavioral intervention package*: Package included goal setting. 2. *Experimental task:* Daily bike riding distance goal with contingent reinforcement.	As goals increased, distance biked increased. Very consistent effect of performance goals on behavior.
Weinberg, Bruya & Jackson, 1985. Experiment 1.	To determine if subjects who set specific difficult goals perform significantly better than do best and to examine the importance of goal proximity.	Experimental.	41 Males 11 Females Ss enrolled in fitness course.	Volunteer Randomly assigned to 1 of 4 goal setting conditions. Experimental procedure over a five week period.	1. *Experimental task:* 3 minute sit-up task. 2. *Questionnaire:* Assess level of commitment, intended effort, satisfaction with performance and importance of reaching maximum.	No support for goal setting as no goal situation produced significant better performance than do best.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

Weinberg, Bruya & Jackson, 1985. Experiment 2	To determine if subjects who set specific difficult goals perform significantly better than do best and to examine the importance of goal proximity.	Experimental.	26 Males 18 Females Ss enrolled in a fitness course.	Volunteer Randomly assigned to 1 of 4 goal setting conditions. Experimental procedure over a 3 week period.	1. *Experimental Task:* 3 minute sit-up task. Difficult sit-up goals more difficult. 2. *Questionnaire:* Same as Experiment 1 with added question.	No support for goal setting as no goal situation produced significant better performance than do best.
Nelson, 1979.	To compare the effects of different types of supplementary information (goals or norms) given prior to an elbow flexion endurance task.	Experimental. 4 groups: Control, realistic norms, fictitious norms and obtainable goal group.	100 male college students.	Volunteer, random assignment to one of four groups.	1. *Strength task:* Elbow flexion strength as measured by a cable tensiometer. 2. *Endurance task:* Elbow flexion with 1/4 maximal strength at 38 reps per min.	The 3 groups receiving additional information performed significantly better than control. Fictitious norms better than realistic and obtainable.

Table summarizing the research conducted examining the use of goal setting as an intervention strategy in exercise and physical activity.

APPENDIX D

Study of The Effectiveness of A Time Management Skills Training Seminar
Investigators: Laurie Hellsten, Dr. Kerry Courneya

Consent Form

This consent form, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research project is about and what your participation will involve. If you would like more detail concerning something mentioned here, or information not included here, you should feel free to ask. Please take time to read this carefully and to understand any accompanying information.

Background Information and Purpose of the Study

Dr. Kerry Courneya and Laurie Hellsten of The University of Alberta are conducting a research study on individual familiarity with time management skills and behaviors and the effect these skills have on exercise. The information used may be useful for developing a time management skills training program to promote exercise behaviors.

Description of the Study

Your participation in the study will involve a two hour seminar on time management skills which will include both class discussion and lecture. In addition, you will be asked to fill out several questionnaires. Each participant will also receive a one month follow-up phone call.

Risks and Benefits of Study Participation

No risk is involved if you choose to participate in this study. You will benefit by receiving training in time management skills which can then be applied to many different situations (e.g. work, school, exercise...).

Confidentiality

If you choose to participate, your questionnaires will be available only to the researchers identified above. The researchers will treat all information with a policy of strict confidentiality. This means that no records bearing your name will be provided to anyone else except the investigators involved in the study. You will not be identified as an individual in any report coming from this study. All data and records evolving from this study will ultimately be shredded.

My signature on this form indicates that I have understood to my satisfaction the information regarding my participation in this research project and agree to participate as a subject. In no way does this waive my legal rights nor release the investigators or the involved institutions from their legal and professional responsibilities. I am free to withdraw from this study at any time. If I have further questions concerning this research project, I may call the research coordinators collect at:

Dr. Kerry Courneya, The University of Alberta: 403-492-1031
Laurie Hellsten, The University of Alberta: 403-492-2829

APPENDIX E

This part of the questionnaire is needed to help understand the characteristics of the people participating in the study. For this reason it is very important information. All information is held in strict confidence and its presentation to the public will be group data only. However, if you feel uncomfortable answering any of the questions, please feel free to leave them blank.

1. AGE: _____

2. GENDER: MALE_____ FEMALE_____

3. MARITAL STATUS: NEVER MARRIED_____ MARRIED_____
COMMON LAW_____ SEPARATED_____
WIDOWED_____ DIVORCED_____

4. EDUCATION: SOME HIGH SCHOOL_____
COMPLETED HIGH SCHOOL_____
SOME UNIVERSITY/COLLEGE_____
COMPLETED UNIVERSITY/COLLEGE_____
SOME GRADUATE SCHOOL_____
COMPLETED GRADUATE SCHOOL_____

5. EMPLOYMENT STATUS: HOMEMAKER_____ RETIRED_____
PART-TIME_____ FULL TIME_____
TEMPORARILY UNEMPLOYED_____
STUDENT_____

6. DO YOU HAVE ANY PREVIOUS TIME MANAGEMENT EXPERIENCE? (Please describe).

_____
_____
_____
_____
_____

Time Management (TMB) Scale

1	2	3	4	5
Seldom True	Occasionally True	True About As Often As Not	Frequently True	Very Often True

1. _____ When I decide on what I will try to accomplish in the short term, I keep in mind my long-term objectives.
2. _____ I review my goals to determine if they need revising or changing.
3. _____ I break complex, difficult projects into smaller manageable tasks.
4. _____ I set short term goals for what I want to accomplish in a few days or weeks.
5. _____ I set deadlines for myself when I set out to accomplish something.
6. _____ I look for ways to increase the efficiency with which I perform my work activities.
7. _____ I finish top priority tasks before going on to less important ones.
8. _____ I review my daily activities to see where I am wasting time.
9. _____ During a workday I evaluate how well I am following the schedule I have set down for myself.
10. _____ I set priorities to determine the order in which I will perform tasks each day.
11. _____ I carry a notebook to jot down notes and ideas.
12. _____ I schedule activities at least one week in advance.
13. _____ When I find that I am frequently contacting someone, I record that person's name, address, and phone number in a special file.
14. _____ I block out time in my daily schedule for regularly scheduled events.
15. _____ I write notes to remind myself of what I need to do.
16. _____ I make a list of things to do each day and check off each task as it is accomplished.

17._____ I carry an appointment book with me.

18._____ I keep a daily log of my activities.

19._____ I use an in-basket and an out-basket for organizing paperwork.

20._____ I find places to work that will allow me to avoid interruptions and distractions.

21._____ If I know I will have to spend some time waiting, I bring along something I can work on.

22._____ At the end of the workday I leave a clear, well-organized workspace.

23._____ When I make a things-to-do list at the beginning of the day, it is forgotten or set aside by the end of the day.

24._____ I can find the things I need for my work more easily when my workspace is messy and disorganized than when it is neat and organized.

25._____ The time I spend scheduling and organizing my workday is time wasted.

26._____ My workdays are too unpredictable for me to plan and manage my time to any great extent.

27._____ I have some of my most creative ideas when I am disorganized.

28._____ When I am somewhat disorganized, I am better able to adjust to unexpected events.

29._____ I find that I can do a better job if I put off tasks that I don't feel like doing than if I try to get them done in the order of importance.

30._____ I underestimate the time that it will take to accomplish things.

31._____ I feel in control of my time.

32._____ I spend a lot of my time on unimportant things.

33._____ I find it difficult to keep to a schedule because others take me away from my work.

34._____ I find myself procrastinating on tasks that I don't like but that must be done.

The following is a list of barriers or reasons people give for not exercising regularly. Please evaluate each item on the list for the degree to which it is a barrier to exercise for you. Please use the following scale to guide you:

1	2	3	4	5	6	7
extremely unlikely	moderately unlikely	slightly unlikely		slightly likely	moderately likely	extremely likely

I am confident that I can exercise regularly during the next four weeks even if....

1. I have no time:

1 2 3 4 5 6 7

2. I have no energy:

1 2 3 4 5 6 7

3 I have no motivation:

1 2 3 4 5 6 7

4. It costs too much:

1 2 3 4 5 6 7

5. The facilities are inconvenient/inadequate:

1 2 3 4 5 6 7

6. I feel ill at ease:

1 2 3 4 5 6 7

7. I feel sick or I am injured:

1 2 3 4 5 6 7

The following questions concern *how much control* you feel you have over exercising regularly during the next four weeks. Please read the questions carefully and circle the number that best represents your current feelings.

1. For me to exercise regularly over the next four weeks will be:

1	2	3	4	5	6	7
extremely easy			moderately easy/difficult			extremely difficult

2. If I wanted to, I could easily exercise regularly during the next four weeks:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree		slightly agree	moderately agree	strongly agree

3. How much control will you have over exercising regularly during the next four weeks?

1	2	3	4	5	6	7
very little control			moderate control			complete control

The following questions ask about your *plans or intentions* for exercise over the next four weeks. Please focus on what you currently plan to do and not necessarily on what you think might happen.

1. I intend to exercise regularly during the next four weeks.

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree		slightly agree	moderately agree	strongly agree

2. I intend to exercise at least _____ times per week during the next four weeks.

3. I intend to exercise with the following regularity during the next four weeks.

Not at all_____:_____:_____:_____:_____:_____:_____Every Day

I intend to exercise at least 3 times per week over the next four weeks.

Definitely_____:_____:_____:_____:_____:_____:_____Definitely Not

Considering a typical week (7 days) how many times on the average have you done the following kinds of exercise for more than 15 minutes during your free time?

When answering these questions please remember to:

-consider a typical (average) week during that time.

-only count exercise sessions that lasted 15 minutes or longer in duration.

-only count exercise that was done during free time (i.e., not occupation or housework).

-note that the main difference between the three categories is the intensity of the activity.

TIMES PER WEEK

a. **Strenuous Exercise** _____
(Heart Beats Rapidly, Sweating)
(E.g., running, jogging, hockey, soccer, squash, cross-country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling, vigorous aerobic dance classes, heavy weight training).

b. **Moderate Exercise** _____
(Not Exhausting, Light Perspiration)
(E.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing).

c. **Mild Exercise** _____
(Minimal Effort, No Perspiration)
(E.g., easy walking, yoga, archery, fishing, bowling, lawn bowling, shuffleboard, horseshoes, golf, snowmobiling)

APPENDIX F

Correlational Analyses

Pearson's Product Moment correlations among all variables for the full sample and the control and experimental groups were conducted at baseline and at follow-up. The means and standard deviations for each variable and the correlations among the variables for each group are discussed in the following sections.

Full Sample At Baseline

The means and standard deviations for each variable and the correlations for the full sample are presented in Table G-1. The correlations within the time management constructs (TMB), the theory of planned behavior constructs (TPB), and the exercise behavior constructs (EB) were assessed at baseline and follow-up for the full sample. At baseline, the relationship between the time management variables was noted. The correlation were all positive and ranged from weak (.21) to strong (.77). The strongest relationships were noted between the full questionnaire, BTMQ, and the sub-scales (.653 to .774;$p<.01$). The weakest relationship was noted between BMTM and BPCT (.210;$p<.05$). In addition, BTMQ had a weak but significant relationship with only one other variable, BStrenEx (.211;$p<.05$). Similarly, the sub-scales BSGP and BPCT also were weakly but significantly related to BStrenEx (.238;$p<.05$, .283;$p<.01$). The time management variables did not significantly correlate with any other variables.

The correlations within the theory of planned behavior constructs were also positive but moderate and ranged from (.46) to (.55). These variables also demonstrated a moderate relationship with BStrenEx (.393, .362, .321;$p<.01$), and BTotEx (.344, .309, .352;$p<.01$). BI also had a weak but significant relationship with BModEx (.254;$p<.01$).

Contrary to the other variables, not all of the exercise behavior variables were significantly correlated with each other. These correlations ranged from weak (.03) to strong (.76). Significant correlations were noted between BMildEx and BModEx (.429;p<.01), BMildEx and BTotEx (.544;p<.01) and between BStrenEx and BTotEx (.756;p<.01).

The correlations within the TMB, TPB and EB at follow-up were very similar to baseline. At follow-up, the relationships between the time management variables were noted. The correlations were all positive and ranged from weak (.24) to strong (.84). The strongest relationship was noted between the full questionnaire, ATMQ, and the sub-scales(.655 to .837;p<.01). The weakest relationship was noted between AMTM and APCT (.239;p<.05). Unlike the baseline correlations, ATMQ was not significantly correlated with any other variable and only AMTM was significantly correlated with AI (.199;p<.05). The time management variables did not significantly correlate with any other variables at follow-up.

The correlations within the theory of planned behavior constructs were positive and moderate and ranged from (.44) to (.51). These variables also demonstrated weak to moderate relationships with AModEx (.337;p<.01, .230;p<.05, .391;p<.01), AStrenEx (.305, .278, .292;p<.01), and ATotEx (.357, .264, .379;p<.01).

Similar to the pattern found at baseline, not all of the exercise behavior variables were significantly correlated with each other. These positive correlations ranged from weak (.18) to strong (.83). Significant correlations were noted between AMildEx and AModEx (.333;p<.01), AMildEx and ATotEx (.574;p<.01), AStrenEx and AModEx (.339;p<.01), and AModEx and ATotEx (.831;p<.01).

Control Group At Baseline and Follow-up

The correlations between the TMB constructs, the TPB constructs, and the EB constructs were assessed at baseline and at follow-up for the control group and were found to be similar to the correlations described for the full sample. At baseline, the relationship between the time management variables was noted. The correlations were all positive and ranged from weak (.254) to strong (.809). The strongest relationships were noted between the full questionnaire, BTMQ, and the sub-scales (.643 to .809;$p<.01$). The weakest relationship was noted between BMTM and BPCT (.254;$p<.01$). The time management variables did not significantly correlate with any other variables.

The correlations between the variables of the theory of planned behavior constructs were positive, moderate and ranged from .55 to .67. These variables demonstrated a significant relationship with BStrenEx (.436;$p<.01$, .282;$p<.05$, 465;$p<.01$) but only in the cases of BPB and BI, was there a significant relationship with BTotEx (.397, .467;$p<.01$). In addition, BI was also significantly related to BModEx (.313;$p<.05$).

The correlations within the time management constructs ranged from weak (.11) to strong (.83). Significant correlations were noted between BMildEx and BModEx (.423;$p<.01$), and BModEx and BStrenEx (.439;$p<.01$). In addition, BTotEx was significantly related to BMildEx, BModEx and BStrenEx (.561, .780, .834;$p<.01$).

The correlations within the TMB, TPB and EB at follow-up were similar to baseline and to the full sample correlations at follow-up. At follow-up, the relationships between the time management constructs were noted. The correlations ranged from weak

(.12) to strong (.81). The strongest relationship was noted between the full questionnaire, ATMQ, and the sub-scales (.593 to .807;p<.01). The weakest relationship was noted between AMTM and APCT (.124). Unlike the baseline corrrelations, ATMQ was not significantly correlated with any other variable and only AMTM was significantly correlated with AI (.292;p<.05). The time management variables did not significantly correlate with any other variables at follow-up.

The correlations within the theory of planned behavior constructs were moderate and ranged from (.38) to (.57). These variables demonstrated weak to moderate relationships with AStrenEx (.334;p<.05, .267;p<.05, .372;p<.01). The variable, APB, was also significantly correlated with AMildEx (.284;p<.05), AModEx (.438;p<.05), and ATotEx (.446;p<.01) while the variable, AI, was significantly correlated with AModEx (.399;p<.01) and ATotEx (.422;p<.01).

The relationships within the exercise behavior constructs for the control group at follow-up ranged from weak (.23) to strong (.85) but were all positive. Significant correlations were noted between AMildEx and AModEx (.549;p<.01), AMildEx and ATotEx (.636;p<.01), AModEx and AStrenEx (.461;p<.01) and AModEx and ATotEx (.802;p<.01).

Experimental Group At Baseline and Follow-up

The correlations between the TMB constructs, the TPB constructs, and the EB constructs were assessed at baseline and at follow-up for the experimental group. At baseline, the relationship between the time management variables was noted. The correlations were all positive and ranged from weak (.18) to strong (.73). However, unlike the full sample and the control group correlations, the sub-scales of the TMB were

not all significantly related to each other. The only significant relationships noted between the sub-scales were BSGP and BPCT (.447;p<.01) and BPFO and BPCT (.335;p<.01). The strongest relationships were noted between the full questionnaire, BTMQ, and the sub-scales (.56 to .73;p<.01). The weakest relationship was noted between BMTM and BPFO (.176). The time management variables did not significantly correlate with any other variables.

The correlations within the theory of planned behavior constructs were moderate and ranged from (.31) to (.57). These variables demonstrated a weak to moderate relationship with BStrenEx (.396, .453, .420;p<.01), and with BTotEx (.294;p<.05, .422;p<.01, .435;p<.01).

The correlations within the exercise behavior constructs differed from baseline correlations of the other samples. The relationships ranged from negative (-.18) to moderately positive (.67). Significant correlations were noted between BMildEx and BModEx (.454;p<.01), BMildEx and BTotEx (.524;p<.01), and BStrenEx and BTotEx (.520;p<.01).

The correlations within the TMB, TPB, and EB at follow-up were similar to the full sample at baseline. At follow-up, the relationship between the time management variables was noted. The correlations ranged from moderate (.34) to strong (.88). The strongest relationship was noted between the full questionnaire, ATMQ, and the sub-scales (.595 to .877;p<.01). The weakest relationship was noted between AMTM and APFO (.342;p<.05). ATMQ demonstrated a significant but weak relationship with only one other variable, ATotEx (.283; p<.05). Significant relationships were observed between AMTM and AMildEx (.277;p<.05), AMTM and AStrenEx (.313;p<.01),

AMTM and ATotEx (.317;p<.01), APCT and AC (.333;p<.05), APCT and AModEx (.305;p<.05), APCT and AStrenEx (.326;p<.01), and APCT and ATotEx (.390;p<.01).

The correlations within the theory of planned behavior constructs followed the pattern of the full sample at follow-up and were moderate, ranging from (.44) to (.56). These variables also demonstrated a moderate relationship with AStrenEx (.341, .326, .302;p<.01). In addition, AC and AI were also significantly correlated with ATotEx (.358, .494;p<.01).

Similar to the patterns seen with the other two samples, not all of the exercise behavior components were significantly correlated with each other. The relationship between the exercise behavior constructs ranged from a weak negative (-.02) relationship to a strong (.75) relationship. It was noted that AMildEx demonstrated an unexpected negative correlation with AModEx (-.022) but a significant positive correlation with ATotEx (.416;p<.01). In addition, significant correlations were noted between AModEx and ATotEx (.581;p<.01) and AStrenEx and ATotEx (.746;p<.01).

Table G-1: Correlation Table Of Full Sample On Pre and Post-test Variables.

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1.BTMQ	0.77*	0.74*	0.68*	.65*	.11	.15	.05	-.05	.04	.21*	.14	.77*	.69*	.55*	.54*	.53*	.05	.07	-.11	.08	.01	.18	.14
2.BSGP		0.30*	.38*	.59*	.10	.06	.04	-.09	.02	.24*	.14	.57*	.73*	.25*	.27*	.50*	.07	.07	-.10	.04	.14	.19	.19
3.BMTM			.33*	.21*	.01	.14	.08	.02	.04	.06	.06	.60*	.35*	.73*	.33*	.17	-.03	.01	-.07	.11	-.11	.08	.05
4.BPFO				.38*	.18	.12	.07	-.01	.03	.11	.08	.54*	.45*	.23*	.70*	.37*	.13	.08	-.01	.02	-.01	.09	.06
5.BPCT					.08	.13	-.16	-.13	.01	.28*	.15	.48*	.48*	.13	.37*	.68*	-.01	.08	-.16	.00	.04	.16	.12
6.BPB						.55*	.46*	.04	.06	.39*	.34*	.06	-.01	.00	.16	.12	.52*	.32*	.34*	.07	.17	.28*	.27*
7.BC							.51*	-.03	.18	.36*	.31*	.08	-.05	.11	.10	.08	.41*	.71*	.41*	-.04	.09	.30*	.21*
8.BI								.08	.25*	.32*	.35*	.13	.00	.27*	.05	-.06	.44*	.47*	.78*	.06	.21*	.29*	.29*
9.BMildEx									.43*	.03	.55*	-.02	-.09	.01	.05	-.03	.04	.03	.11	.61*	.20*	.04	.30*
10.BModE										.17	.70*	.02	-.01	.07	-.04	.01	.17	.19*	.38*	.37*	.51*	.29*	.50*
11.BStrenEx											.76*	.05	.04	.05	-.04	.11	.24*	.28*	.28*	.14	.26*	.78*	.65*
12.BTotEx												.03	-.01	.07	-.03	.07	.25*	.28*	.39*	.47*	.46*	.66*	.75*
13.ATMQ													.84*	.79*	.65*	.66*	.09	.18	.04	.02	.08	.03	.06
14.ASGP														.47*	.41*	.61*	.02	.11	-.10	-.01	.11	.01	.05
15.AMTM															.32*	.24*	.09	.18	.20*	.11	.04	.07	.10
16.APFO																.42*	.02	.09	-.02	-.11	-.03	-.07	-.09
17.APCT																	.16	.13	-.08	.00	.13	.06	.09
18.APB																		.45*	.44*	.09	.34*	.31*	.36*
19.AC																			.51*	-.01	.23*	.28*	.26*
20.AI																				.12	.39*	.29*	.38*
21.AMildEx																					.33*	.18	.57*
22.AmodEx																						.34*	.72*
23.AStrenEx																							.83*
24.ATotEx																							

Note: Correlation is significant at the 0.05 level (2-tailed).